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Improving Appliances

NUCLEUS OF AN APPROVAL SYSTEM

FOR many years it has been realized that the sale of unsafe or unsatisfactory electrical appliances is likely to do much harm and that steps should be taken to protect the public, and, incidentally, the industry itself, against the consequences.

Two methods suggest themselves. The radical one is the "approval" system by which only appliances which have been passed by a recognized authority are considered suitable for use. It is a method which can only be fully effective if it is given statutory force for which public opinion has not been prepared.

Testing House

The alternative is less satisfactory but more immediately practicable: the testing of appliances, already marketed, which are suspected of being defective, with a view to their improvement or removal. This was the aim of the Advisory Committee on Electrical Appliances and Accessories set up jointly by the British Electrical Development Association and the B.S.I. towards the end of 1947 which resulted in the establishment of a Testing House; an account of its first eighteen months' work is given in this issue.

It may be said that the handling of only 46 appliances believed to be defective does not represent much progress towards the goal of total elimination of dangerous equipment, but that would not be quite fair to the sponsors.

In the first place, the Advisory Committee does not take the initiative; it is left to others to bring before the Committee instances of bad design and construction. Most of the tests originated in inquiries from supply authorities, wholesalers and contractors. The public in general which obtains appliances from non-electrical sources and discovers defects when they are put into use is not aware of the existence of the Testing House. It was to remedy this that Mr. F. Newey, the chairman of the Committee, held a general Press conference last week.

The number of appliances actually tested is not a true indication of the extent of the Committee's influence. In several cases the type of appliance condemned was withdrawn from sale or defects were remedied and that may have accounted for hundreds of units. Moreover, a check of this kind may have caused the producers to observe the rules in respect of their other manufactures.

Manufacturers' Approach

Probably the most encouraging feature of the work of the Testing House has been the voluntary submission by manufacturers of samples of appliances which they propose to put on the market. This is a move towards the approval system and is a more effective way of dealing with the problem—nipping danger in the bud rather than taking action when much harm may have been done. It was a small beginning—only twelve submissions—but the fact that in eight cases modifications were necessary suggests that even presumably reputable makers are apt to fall short of the ideal. What then must the others be like?

The extension of the Committee's work into the international field is most interesting. Other countries have regulations which are applied rigorously to imported equipment, as some of our manufacturers have discovered. By virtue of its membership of the International Commission on Rules for the Approval of Electrical Equipment the Committee is not only in a position to advise British manufacturers of the requirements for overseas markets, it will also be able to secure modifications of rules to bring sound British equipment within their scope. It is clear that the Committee is deserving of the support of all those concerned with the maintenance of the electrical industry's reputation and that there are great possibilities in the extension of its work.

UNLEARNED LESSON

ALTHOUGH power is the principal tool in our factories and although inadequate power has led to industrial dislocation, the Prime Minister included in his tale of economy measures on Monday a threat to the fuel and power industries. He said that a substantial saving in capital expenditure could be achieved in this field but "so far as possible, the necessary cuts will be made at the expense of long-term projects." From this there can be no immediate "relief"; the Government is merely storing up future trouble if it stops the building of power stations which are all "long-term projects." Any slowing down in the building of stations now in hand will merely add to construction costs and prolong the present unsatisfactory position. We ask the Government to consider well before going any further.

COLLIERY POWER STATIONS

SINCE the generation of electricity is the recognized function of the British Electricity Authority, as the winning and preparation of coal is that of the National Coal Board, the responsibility for pit-head power stations designed to burn coal not worth transporting would appear at first sight to belong to the former. On the other hand, Mr. B. L. Metcalf has pointed out (page 821) that the operation of colliery boiler plant is bound up with the cleaning process. There is also apparently a fear that incentive to development in the separation of low grade fuels will be lost if the reduced cost of electricity thus obtained locally is spread over the country. There are, however, commercial precedents for securing economical engineering arrangements that do not necessarily raise questions of ownership.

PRICE OF COAL

THE question of the price to be paid by the N.C.B. for electricity is in some respects the obverse side of that regarding the price of power station coal. Messrs. E. Forth and J. B. Jackson (page 822) state that boilers can be designed to burn coal unsuitable for other purposes provided encouragement is given in a cost per B.Th.U. that is low enough to cover the heavier capital, maintenance and operation charges entailed in drying and burning the coal and disposing of the ashes. The present coal-price structure certainly offers no such encouragement.

A COMPREHENSIVE GUIDE

THE welcome given in official and industrial circles to the new BEAMA Catalogue is evidence of the fact that it was badly needed. To give a prospective purchaser sufficient detail of the kind of equipment he needs and tell him where he may obtain it is a potent method of securing business and we hope that all our trade representatives overseas will make full use of the Catalogue. There is little in the way of electrical equipment from turbo-alternators to kettles that cannot be found in the 868-page volume. We are happy to have been associated with the compilers and publishers in this valuable piece of work.

TRANSATLANTIC TRADE

A NOTABLE departure by the Export Credits' Guarantee Department was announced last week. In addition to its normal business of insuring exporters against credit risks the Department will now undertake to guarantee them against losses on market surveys and advertising and "promotion" expenses and on goods held in stock in the buying country to ensure quick delivery. At present these new facilities will be confined to Canada and the United States. They should provide much-needed encouragement to manufacturers.

Turbine House Construction

First Reinforced Concrete Shell-roofed Type in this Country

THE turbine house now being constructed at the British Electricity Authority's Skelton Grange power station, Leeds, is a reinforced concrete structure of considerable interest. Only half the total length is at present being built; this section is approximately 400ft long and is divided into fourteen bays, each 31ft long and 79ft wide. The half building will house three 60,000 kW turbo-alternators, and the completed station as now designed will be of 360,000 kW capacity. The turbine house represents about 25 per cent of the area of the main building.

The main structure consists of a series of reinforced concrete portal frames supporting a shell concrete roof. In addition, the frames support, on one side, a three-storey reinforced concrete block containing the electrical control gear and, on the other, the main tank rooms which are at roof level and are also of reinforced concrete. A large part of the turbine operating floor, which is 30ft above ground level, is also supported by the frames, being cantilevered from the main structure; it is isolated from the turbine blocks by a gap which prevents the transmission of vibration.

A 150-ton electric overhead travelling crane runs the full length of the turbine house, 30ft above turbine floor level. It spans 70ft 6in, each end running on an

The illustration on this page is an interior view from the completed end of the shell-roofed turbine house

Travelling carriage on crane rails used for constructing the shell roof, thus keeping the floor space clear of scaffolding. The expansion joint between secondary ribs, also roof lights are shown

articulated carriage with three wheels at 12ft centres. The crane rails are flat bottom rails on a 12in by 1in plate bolted to the concrete crane beams. The maximum loading on one rail is 200 tons.

The portal frames, the columns of which are of 5ft by 2in 6in section below the crane beams and 2ft 6in by 1ft 4in above this level, are so designed that the point of contraflexure under the various loadings is approximately at crane level. The moments at the springings being small, the cross ribs have been made deeper at the centre than at the springings, which is an unusual arrangement in a frame of this type. It has the advantage that the end clearance for the travelling crane is improved.

In order to obtain a satisfactory appearance in such a long building, the radius of curvature at the bottom of the main ribs was made the same as the radius of the shell roof, so that the various intersections appear parallel when viewed from below.

Owing to the great height above ground level (88ft to the crown of the roof slab) it was decided to construct the roof from a travelling carriage running on the crane rails. This method also left the floor space clear of scaffolding, except that required for constructing the columns. It permitted other work in the turbine house to proceed unhampered.

The travelling carriage consisted of two main trusses spanning the width of the building and designed to pass below the cross ribs of the structure so that by lowering the roof formwork and its supporting frame on to the working platforms, the whole carriage could be pushed forward to construct the next bay. This operation took eight hours.

Ten days were allowed for the hardening of the concrete before striking the formwork, but in order to reduce the stresses on striking, a tie was inserted between the main columns just below the springings. This tie consisted of a flat plate connected by turn-buckles to a stirrup

passing round the columns and supported by cradles running on the cross members of the travelling carriage. The tie could remain in position until the subsequent bay was completed, giving an additional 2½ weeks of hardening before the full dead-load stresses were applied. Expansion joints are provided in the roof, in the centre of every third bay.

The concrete is a nominal 1 : 1½ : 3 mix with a working stress of 1,100 lb/sq in, except for that section of the main columns between 15ft and 60ft above foundation level, where a 1 : 2 : 4 concrete was sufficient. The columns were cast in lifts of 8ft and a construction joint was formed in the main cross ribs just above springing level, so that the columns and edge beams at the springing could be carried out ahead of the construction of the roof. The concrete of the 3in thick roof slab was placed between screeds at 8ft centres following the curve of the arch. An opening left in each bay of the roof is subdivided by ribs to support eight panels of "Lenscrete" roof lights, precast and resting on kerbs, the tops of which are slotted at intervals for ventilation to prevent condensation on the underside of the glass. The roof has two layers of mastic asphalt and will be sprayed internally with ¾in of asbestos to provide thermal insulation.

This turbine house has been constructed during the past twelve months and the rate of progress has been within the programme of one bay per month. The boiler house adjoining is steel framed and the two methods of construction have proceeded side by side. The concrete construction of the turbine house has permitted far greater freedom for other work to proceed on the floor beneath than has been the case with the steel-framed boiler-house building, with the additional advantage of roof cover.

The architectural design of the building elevations for the power station is in the hands of Mr. R. A. H. Livett, O.B.E., A.R.I.B.A., Leeds city architect, with Merz & McLellan as consultants, who are assisted by Sir Alexander Gibb & Partners on the civil engineering side. The erection of the turbine house is being carried out by Holst & Co., Ltd., to their own designs, which were made in collaboration with Chisarc & Shell "D," Ltd., for whom Mr. H. G. Cousins, B.Sc., M.Inst.C.E., acted as consulting engineer.

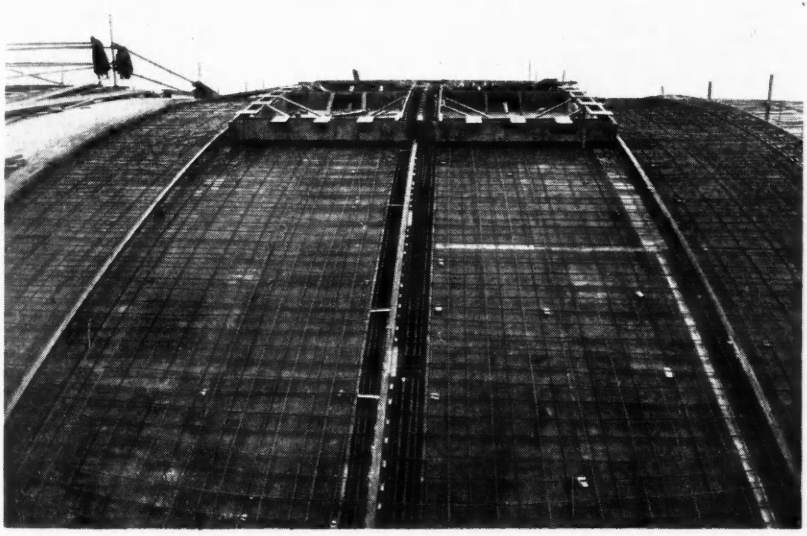

Illustration of the exterior of one of the expansion joints in the roof before the concrete was placed

Supervising Engineers

Their Status and Future

HAVING accepted an invitation to continue as president of the Association of Supervising Electrical Engineers, Mr. A. G. Ramsey (Ministry of Supply) delivered his inaugural address last week and spoke on the status and future of supervising engineers. Essentially, his address comprised an amplification of the one delivered last year in which he pleaded strongly for a widening of the Association so that all supervising engineers, whether they were electrical engineers or not, could become members.

Mr. Ramsey began by reviewing the Association's work and achievements and considered its present position. He said that in 35 years it had grown up to be the leading technical organization in its field of operation, with forty branches throughout the world. Its technical activities were more extensive than usually recognized, and during the past year there were 259 events of technical interest, which included lectures, papers, discussions, films and visits. Some 51 per cent of these were entirely electrical in interest, 20 per cent electro-mechanical, 3 per cent mechanical, and 26 per cent more general in character.

Matters for Attention

While recognizing these accomplishments, the president felt that only the surface had been scratched. The outstanding problems demanding attention included uniformity of designation and recognition of status, the promotion of interest and effort by members, co-operation between industries and the supervising engineers in them, and extension of the Association's influence and a realization by engineers of their sociological responsibilities.

With reference to the last, Mr. Ramsey criticized the tendency of the members of engineering institutions and associations to look upon them only from the angle of their own individual benefit. Decisions were all too often taken without bothering to find the view of branches in other parts of the country. Because of this, engineers suffered from that absolute power and tyranny of custom which was everywhere the standing hindrance to human advancement.

One branch of engineering could not progress by isolated interest in its own affairs. Many non-electrical supervising engineers outside the electrical industry might like to join the Association, but no one had troubled to find out. The president saw a danger in the formation of small organizations with limited aims and scope, and this could be avoided if the Association extended its interests. This could result in a strong and influential body in which members would have the opportunity of learning more about engineering in its broadest sense and even carry matters further by studying the sociological and economic reactions of scientific and engineering developments and discoveries on the community generally.

President's Disappointment

Mr. Ramsey was disappointed to learn of the rejection of the Executive Council's recommendation at the Annual Conference last May to widen the scope of the Association. He felt that the fear of losing electrical personality and being smothered or suppressed by an influx of men belonging to other branches of engineering was groundless and illogical. Progress was not an accident but a necessity; it was the law of life and not to advance was to go back. During the period of its existence the Association had undoubtedly travelled along a path of progress, but the time had come when this path should be made into a high-road.

I.E.E. North-Eastern Centre

THE jubilee dinner of the North-Eastern Centre of the Institution of Electrical Engineers will be held on 23rd November at the Royal Station Hotel, Newcastle-on-Tyne. Applications for tickets (£1 1s each) should made by 1st November to the assistant secretary of the Centre, c/o A. Reyrolle & Co., Ltd., Hebburn, Co. Durham.

Views on the News

By REFLECTOR

OLD legal documents have been a popular material for lampshades for some time now. So popular has the practice become that it has drawn a warning and protest from Lt.-Col. G. E. G. Malet, of the National Register of Archives. He says that lampshades made from old parchments are depriving us of fragments of our history. I like my parchment plain, but those who prefer indentures, agreements and such should surely wait until some sort of clearing house, say the National Register of Archives, has written them off as of no historic value.

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What are the South Western Electricity Board's designs upon Bristol? The local Planning and Reconstruction Committee has been informed that the Board intends to display posters warning of winter power cuts on substations, pillars, kiosks and poles throughout the city. The Committee has decided to tell the Board that there are better ways of giving information to the public than by defacing streets. Although I do not suppose that the Board proposes to entirely paper the city, as seems to be feared, it will now probably shrink from incurring civic odium in its laudable desire to protect the citizens from inconvenience.

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A quartet composed of two trade union officials, the secretary of an employers' organization and a newspaper correspondent may be expected not to agree. This, in fact, was the case in the discussion on "The Trade Unions To-day," broadcast in the B.B.C. Home Service last week. Mr. L. C. Penwill, director and secretary of the National Federated Electrical Association, felt that the political activities of trade unions tended to destroy confidence between the employer and worker, such as the preaching of the doctrine of nationalization which would destroy the employers' legitimate business. Mr. A. Deakin (Transport and General Workers' Union) denied that politics entered into negotiations between employer and worker; these activities were kept separate, he asserted. One point that I think the speakers might have commented on occurred in a statement by Mr. J. Killen, Labour Adviser to the Economic Administration Mission to the U.K., that in the United States the unions regard increased mechanization as a springboard to better conditions. In fact, the unions retain their own staffs of technicians to work with employers in increasing efficiency.

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Following up my last week's fish story is a note from Metrovick. A customer of theirs ordered some ultra-violet ("black") discharge lamps. The customer and some of his friends decided to stock a lake with trout, but before this could be done it was necessary to eliminate the pike, which are fond of trout fry. The lamps were immersed in the lake at night. The fish were attracted to the faint visible glow from the lamps so that on coming within the range of the ultra-violet discharge their scales were caused to fluoresce. This quickly attracted other fish until there was a crowd in the area. Copper plates immersed in the water about 20ft apart, on both sides of the lamps, were then energized with 300 V a.c., which was sufficient to stun all the fish, enabling the unwanted pike to be removed with nets. Immediately the current was switched off the remaining fish recovered and seemed none the worse.

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The oblique or indirect method of advertising is much favoured nowadays. It is never surprising to find that an announcement having as its principal feature a glamorous film actress is, in fact, a steel company's advertisement. In much the same way a view of the picturesque bridge at Aylesford, Kent, is used by the South-Eastern Electricity Board to introduce its "off-peak" campaign. On the reverse of the leaflet bearing the illustration the need for economy during peak load hours is explained, but it is stressed that unrestricted use at other times is in order. Hints are given on the best methods of water heating, room heating, and cooking to achieve the desired end.

Instrument Makers' Jubilee

IN 1899 Nalder Bros. & Thompson, Ltd., was incorporated as a limited company, and to mark the fiftieth year of incorporation a jubilee dinner was held on Saturday last at the Shoreditch Town Hall, at which Mr. A. G. O'Neill, chairman and managing director, presided.

The history of the business actually begins in 1884, when Mr. F. H. Nalder and his brother, Mr. H. Nalder, began to make electrical testing instruments and physical apparatus at Brentford. Two years later they were joined by Mr. C. W. Crawley (inventor of the "Crawley" automatic cutout), and on the removal of the works to Horseferry Road, Westminster, in 1887, they were also joined by Mr. A. Soames (inventor of the "Soames" electrical brake), accounting for the company's trade mark "N.C.S." The business was divided in 1896, Mr. F. H. Nalder purchasing the goodwill of the ammeter and voltmeter business, which was carried on under the title of Nalder Bros. & Thompson, and the testing, physical and other instrument work was disposed of in 1897 to Muirhead & Co.

Dalston Lane Works

On the incorporation of the company in 1899 works were established at Dalston for the manufacture of l.v. switchgear, circuit breakers and switchboards, in addition to the manufacture of instrument parts for the main works; eventually the Dalston Lane Works took over the whole of the production. During the war years part of the business went to Stroud, Glos., under the management of Mr. D. W. Nalder. In 1946 further premises were acquired at Poole, Dorset, where smaller specialized apparatus is now being manufactured.

At last Saturday's dinner, the toast of the company was proposed by Col. B. H. Leeson, director of BEAMA, who said that the occasion also marked half a century of service by Mr. O'Neill. Mr. Nalder was among those responsible for the National Electrical Manufacturers' Association, and when this Association became the BEAMA he was elected its first chairman. Mr. Leeson mentioned the valuable work of Mr. Nalder's successors, Messrs. A. F. Harris and Mr. G. F. Pittar, and paid special tribute to Mr. O'Neill, who had succeeded Mr. Pittar as chairman.

The company had played an important part in the development of the electrical industry, and its protective relays had been invaluable in maintaining the continuity of electricity supply, especially during the war years.

Mr. O'Neill, in responding, briefly mentioned landmarks in the company's career, and referred to the co-operative "family" spirit which existed throughout the works. He said that of their 350 employees over one-third had been with the company for more than twenty years, while there were a number with over forty years' service.

The toast of the guests was proposed by Mr. D. W. Nalder (director), and responses were made by Messrs. A. Hirst and Mr. E. R. Sarney. Following dinner, there was a cabaret and dancing.

Faraday House Dinner

THE annual dinner of the Faraday House Old Students' Association was held on October 21st, with Mr. L. H. Short, president of the Association, in the chair. The toast of "Faraday House" was briefly proposed by Professor E. B. Moullin (President I.E.E.), who gave a few happy reminiscences of the former Principal, the late Dr. Alexander Russell. In response, Dr. W. R. C. Coode-Adams (Principal, Faraday House) stated that the college premises had now been vacated by the Excise Department and were being restored with a new mechanical laboratory and up-to-date machinery. Their aim was to give students a sound engineering grounding before letting them specialize. He referred to the distinctions conferred on some of the 3,000 students (including five women) who had passed through Faraday House since its foundation 60 years ago.

Mr. F. Smith (immediate past-president, F.H.O.S.A.), proposing "The Guests," referred to the importance of exporting engineers as well as goods. With this view Mr. A. G. Bottomley (Secretary, Overseas Trade, Board of Trade), responding, expressed his full agreement, and emphasized the importance of the Canadian market in view of potential hydro-electric developments. Price and early delivery dates were important, and so was direct representation of British firms. The South American countries provided small difficult markets, but these and also India and Pakistan, were well worth cultivating.

The health of the chairman was proposed by Sir George Nelson (chairman and managing director, English Electric Co., Ltd.), who mentioned Mr. Short's work in connection with jet bombers and his war services generally before he became director of export trading of the English Electric Co.

Mr. Short, in reply, said the extent to which young men, like their forefathers, went overseas was apt to be forgotten. The first essential was that those who did should be good engineers, but knowledge of the language and literature of a foreign country was important.

Personal and Social

NEWS OF MEN AND WOMEN OF THE INDUSTRY

TUBE INVESTMENTS, LTD., has appointed **Mr. I. G. Slater,** M.Sc., Ph.D., C.I.Mech.E., F.I.M., formerly Director of Operational Research, Admiralty, as director of research and development of its Aluminium Division. Attached to the administrative and marketing organization, TI Aluminium, Ltd., he will be concerned with the research and development of the TI aluminium manufacturing subsidiaries, Reynolds Rolling Mills, Ltd., Reynolds Light Alloys, Ltd., and the South Wales Aluminium Co., Ltd.

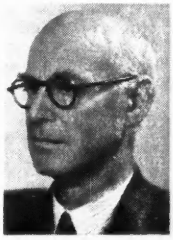
Mr. H. K. Parsons, managing director of Gent & Co., Ltd., sails for Canada and the United States in the *Queen Elizabeth* on 29th October. The purpose of the trip is to find out how the company can best meet the requirements of the Canadian and American markets and to make local distribution arrangements for Gent products in these areas.

Mr. P. M. Wilson, A.M.I.E.E., has been appointed deputy chief engineer to the South Western Electricity Board, in succession to **Mr. A. W. Allwood** who, as already announced, is taking up the position of manager of the Torbay District. Mr. Wilson was previously distribution engineer (planning) at the Board's head office. Mr. Wilson received his technical training at Edinburgh University and at the Heriot-Watt College. On completing his engineering training with Bruce Peebles & Co., Ltd., he joined the Edinburgh Corporation Electricity Department and in 1925 he transferred to Bristol where he was later appointed mains engineer.

Mr. P. M. Wilson

Mr. H. Pearce, B.Sc.(Eng.), M.I.E.E., has been appointed consultant to the chief electrical engineer of the Metropolitan-Vickers Electrical Co., Ltd., as from 1st October. He is succeeded as chief engineer, Switchgear Department, by **Mr C. H. Flurscheim,** B.A., M.I.E.E.

Mr. Pearce was educated at Kingswood School, Bath, and obtained his technical training at Finsbury Technical College and the Northampton Institute, Clerkenwell. He joined the old British Westinghouse Co. in 1912, and became section leader in charge of projects and tenders, Switchgear Engineering Department. From 1919 to 1926 he was with the British Thomson-Houston Co., latterly in charge of switchgear engineering at Willesden Works. Mr. Pearce returned to M-V in 1927 and in 1929 was appointed chief engineer, Switchgear Department, his duties being later extended to cover all the company's switchgear activities.



Mr. H. Pearce

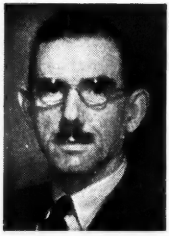
Mr. C. H. Flurscheim

Mr. Flurscheim was educated at Wellington College and Trinity College, Cambridge. He joined M-V as a college apprentice in 1927, afterwards taking up an appointment on the staff of the Switchgear Engineering Department. During this time he spent a year with the General Electric (U.S.A.) as an I.G.E. Fellowship student. In 1936 he took over the high-voltage division of the M-V Switchgear Department. During the war period he was responsible for the development of the series of electrical components for aircraft, including electro-mechanical undercarriages, retraction units and miniature circuit-breakers. In 1945 he became assistant chief engineer of the Switchgear Department. Mr. Flurscheim is the author of several I.E.E. papers and other publications.

Mr. W. Adam, B.Sc. (Eng.), A.M.I.E.E., has been appointed to succeed the late Mr. J. Miller as manager of the

Glasgow district office of the British Thomson-Houston Co., Ltd. Mr. Adam was born at Greenock, and after graduating at Glasgow University served a student apprenticeship at the B.T.H. Rugby Works. He then obtained commercial engineering experience in the Industrial Sales Department, Rugby, and at the B.T.H. Newcastle upon-Tyne district office, before being transferred in 1929 to the Glasgow district office as sales engineer. He was appointed assistant manager in September, 1948.

Air Commodore (Ret.) R. C. Wansbrough, M.A., M.I.E.E., M.Brit.I.R.E., has recently been appointed as personal assistant to Mr. E. J. Emery, managing director of E.M.I. Sales & Service, Ltd. Air Commodore Wansbrough was educated at King Edward's High School, Birmingham, and at Cambridge, where he took an engineering degree. In the 1914-18 war he served in the Army, the R.F.C. and the R.A.F. For a short period he returned to civilian electrical engineering, and in 1921 rejoined the Royal Air Force and became a pilot, since when he has served continuously and has held many posts including that of Deputy Director of Radio Repairs at the Ministry of Aircraft Production and Director of Radio at the Air Ministry. During the war his work at M.A.P. as liaison officer with the company gave him every opportunity to become familiar withh its activities.



Air Commodore R. C. Wansbrough

Mr. C. J. Miles, M.B.E., has been appointed public relations officer to the General Post Office in succession to Sir Drummond Shiels, M.C., who has retired.

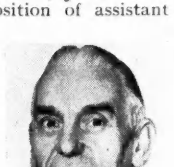
Mr. A. H. Bull, export manager of Oldham & Son, Ltd., left London on 17th October for the United States, on the first stage of a 40,000 mile business tour by air. Mr. Bull's itinerary will include Australia, New Zealand, India, Egypt, Turkey and Greece. He will be away for three months.

Mr. J. D. Ravenscroft, recently transmission engineer in the East Midlands Division of the British Electricity Authority, is leaving England by air early in November to take up a position in Australia. Mr. Ravenscroft left the Willesden Corporation Electricity Supply many years ago to take part in the electrification of the Melbourne (Australia) suburban railways where he remained as electrical superintendent to the railways for fifteen years before joining the Central Electricity Board.

Mr. H. A. Woodyer, until recently sales manager of Kolectric, Ltd., has now been appointed managing director of the company. Mr. Woodyer was radio sales manager for Simmonds Aerocessories, Ltd., and also of Nevilles (Liverpool), Ltd., coil winding machinery manufacturers, from 1940 to 1946, and before that was for several years with the Telephone Manufacturing Co., Ltd., and the Dubilier Condenser Co., Ltd.

Mr. A. P. Brown, for over forty years secretary of Wood & Cairns, Ltd., of Edinburgh, with which he had served altogether for fifty-seven years, retired on 31st August last. On 17th October a dinner in Mr. Brown's honour was given by the company at the Roxburghe Hotel, Charlotte Square, Edinburgh, at which the directors, managers and senior members of the staffs from Edinburgh, Glasgow and Dundee were present. The chairman and managing director, Mr. J. Edwin Lamb, who was in the chair, proposed Mr. Brown's health and spoke of his record period of service. Tributes were paid also by the vice-chairman and others. Presentations were made on behalf of the staff and of the company.

Councillor W. H. Malcolm, J.P., whose retirement from the position of assistant general manager of the telephone works, Coventry, of the General Electric Co., Ltd., was briefly reported in our last issue, began his career with the G.E.C. forty-nine years ago as an unpaid apprentice at Salford, and in 1908 he saw the opening of the Peel-Connor works in the town. With the arrival of automatic telephony the Peel-Connor works of the G.E.C. needed room for expansion and were moved to Coventry. Mr. Malcolm went with them and, in course of time, he became assistant works manager, works manager, and finally assistant general manager. In recent years he has devoted much time to improving and furthering social and welfare schemes in the telephone works. In addition to his work for the G.E.C., Mr. Malcolm has had a long and successful career of public service, culminating in his election as Mayor of Coventry for 1948-49, when the accompanying portrait was taken. On the occasion of his retirement Mr. Malcolm was presented with a television set and a cheque by Mr. R. E.



Councillor W. H. Malcolm

Robinson, managing director of the Telephone, Television and Radio Works of the G.E.C., at Coventry, on behalf of employees throughout the works.

Mr. A. Miller has resigned from the board of the British Electric Traction Co., Ltd., and **Mr. K. E. Garcke** has been elected a director to fill the vacancy.

Thorn Electrical Industries, Ltd., announces the appointment of **Mr. K. E. E. Lee** as sales manager of their Lighting Division with effect from 3rd October. Mr. Lee, who was previously with Philips Electrical, Ltd., as lamp sales manager for London and the Home Counties, will take over the control of sales of Atlas incandescent and fluorescent lamps throughout Great Britain.

Mr. K. E. E. Lee

Mr. G. E. Day, who was for twenty years with Simpson, Baker & Co., Ltd., has joined the Gothic Electrical Supplies, Ltd., at their head office in Birmingham, to take charge of the order and despatch departments.

The Long Service Association of the **Micanite & Insulators Co., Ltd.,** held its annual dinner at Lysbeth Hall, Soho Square, London, on 15th October, when 157 members and guests attended, including Major S. M. Mohr, O.B.E., M.C., M.I.E.E., president, and Mrs. Mohr, who made presentations, together with certificates, to eight members who have recently completed twenty-five years of service and to three members who are retiring from the company's employment. The Association now has a membership of 118 and includes eight with service of forty years or more, forty-three between thirty and forty years and twenty-eight between twenty-five and thirty years' service.

The dance and carnival of the Birmingham Branch area of the **Electrical Industries Benevolent Association,** which was held at Magnet Club, Witton, on 7th October, was attended by over 500 people representing all sections of the industry, and was an outstanding success. It is hoped that a sum of over £200 will accrue from the proceeds of the dance and side-shows, and that the carnival dance will become an annual event.

On 15th October, the **Liverpool Electric Cable Co., Ltd.,** entertained a party from their associated company, **Frederick Smith & Co.,** of Salford, and revived their annual competition for the "A. N. Smith" bowls challenge cup, which was suspended during the war years. The result of the competition was a win for Liverpool Cables. Mrs. J. R. Cox (wife of the technical engineer of Liverpool Cables) presented the cup to Mr. J. T. Frost, the non-playing captain of Liverpool Cables. After the game, the players and friends were entertained to tea, when Mr. J. T. Frost (works manager) expressed the hope that the competition would continue to be one of the sporting events between the two companies. He proposed a vote of thanks to the visitors. Mr. G. W. Child (general manager of Frederick Smith & Co.) responded.

On 21st and 22nd October, the Dramatic Section of Victoria Works Athletic Club of **Johnson & Phillips, Ltd.,** staged their first production to packed houses in the staff canteen at Charlton. An excellent comedy drama in three acts entitled, "To Kill a Cat" proved a great success, and was well acted. The play was produced by Mr. W. Douet, and was excellently staged. The appreciative audience included Mr. W. Glass, joint managing director of Johnson & Phillips, and Mr. F. Leighton, general manager of the Telegraph Construction & Maintenance Co., Ltd.

An interesting ceremony took place at the Strowger Works of **Automatic Telephone & Electric Co., Ltd.,** on 18th October, when Mr. A. F. Bennett, the joint general manager, paid a tribute to Messrs. W. J. and T. R. Dixon, who have each completed fifty years' service with the com-

Presentation to employees of the Automatic Telephone and Electric Co.

Left to right: Messrs. A. Bell, assistant manager; A. J. Leyland, director and joint general manager; W. S. Vick, works manager; T. R. Dixon; A. F. Bennett, director and joint general manager; J. Mason, manager; W. J. Dixon; and J. C. Wrighton, general sales manager.

pany. Mr. T. R. Dixon, who is a foreman of the switchboard wiring Department, was presented with an auto-change radio-gramophone, and his cousin, Mr. W. J. Dixon, who is chief of the Technical Cost Department, was presented with a gold watch and a gold bracelet for his wife.

Noel Coward's play "This Happy Breed" has a cast of ordinary people but in incapable hands they can be made to appear extraordinary. The **G.E.C. Dramatic Society** successfully avoided this last week when they put the play on at the Fortune Theatre, London, W.C.2. All the characters were lifelike, although one or two of them tended to lapse into caricature occasionally. Principal honours went to William Peacock as Frank Gibbons, around whom the action revolves, but he was admirably backed up by the rest of the players—Moira Threlfell, Norah Symonds, Jean Freeman, Stanley Wells, Keith Clifton, Evelyn Rush, Betty Michell, James Hall, Joyce James, Norma Howell and Ronald Turner—and by the stage manager (Ernest Adams) and his assistants. The proceeds of the three performances are to go to the Royal Commercial Travellers' Schools, Mr. Leslie Gamage (vice-chairman of the G.E.C.) and the Hon. Mrs. Leslie Gamage were among the "first nighters."

Mr. R. G. Brandon, general sales manager, Lamp and Lighting Department, British Thomson-Houston Co., Ltd., will shortly take up full-time duties with the Hotpoint Electric Appliance Co., Ltd., with special interest in refrigeration.

Mr. R. G. Brandon

Mr. Brandon, who has been a well-known figure in the electric lamp industry for many years, completed twenty-five years with B.T.H. in August this year. He has been a director of Hotpoint since 1945 and his full-time appointment with that organization will date from 1st November, when he will relinquish his post with the B.T.H.

On 6th October the directors of **Oldham & Son, Ltd.,** entertained a number of their service station agents and distributors at a dinner and social evening at the Holborn Restaurant, London. More than 250 guests from all parts of the country attended. Mr. S. J. Wrigglesworth, director and general manager presided. Two of the three joint managing directors, Mr. J. Oldham, O.B.E., J.P., chairman of the company, and his brother, Mr. E. C. Oldham, were present. Mr. G. Oldham was unable to attend owing to indisposition.

About 400 of the oldest employees of **Higgs Motors, Ltd.,** were present at a dinner held at the Grand Hotel, Birmingham, on Monday last. Proposing the toast of "The Firm" Sir Patrick Hannon, M.P., said that the company had reflected credit on everyone connected with it and there was no better example of private enterprise. He referred to the effects of devaluation. In reply Mr. Walter Higgs, chairman, said that orders were not coming in well from America at present and he thought they would have a small set-back. He was confident, however, that the company would surmount its troubles. Mr. Higgs presented clocks as long service awards to Messrs. H. J. Charles, W. Jeffries, E. Allender, L. J. H. Mansell, S. T. Perkins and H. T. Patchett (director and works manager), each of whom had served thirty years or more with the company. A table lighter was presented to Mr. Higgs by Mr. E. Boraston on behalf of the employees. Mrs. Higgs, who has been a director for fifteen years, proposed the toast of the guests and Alderman H. Robert, M.P., replied.

Obituary

Col. A. P. Pyne.—The death occurred on 10th October of Col. Albert P. Pyne, R.A. (T.Ret.), M.I.E.E., who was well known in the shipbuilding and cable-making industries. He was at one time chief electrical and works engineer of Palmers Shipbuilding Co. Later he became managing director of the Redhough Iron and Steel Co., which he left to join Johnson & Phillips, Ltd., as manager of the Cable Department. He resigned from Johnson & Phillips to take up the position of Cable Department manager and a director of Ismay Cables, Ltd. For a short time during the last war he was engaged at Cockatoo Island Dockyard, Australia, returning to this country in 1942. Col. Pyne served on several committees of the Institution of Electrical Engineers, and was chairman of the Ships' Electrical Equipment Committee.

Mr. John Barke, M.I.Min.E., who retired on pension only fifteen months ago, after twenty-five years in charge of the Mining Department of Oldham & Son, Ltd. Denton, Manchester, died at Reddish, Stockport, on 12th October at the age of seventy-one. Mr. Barke began his mining career at the age of twelve, and by studying at night gained a scholarship to Nottingham University. A recognized authority on miners' lamps, Mr. Barke was directly associated with the promotion of regular

candle-power tests and scheduling of lamp performance. Before joining Oldham & Son, he was a colliery manager at No. 2 Colliery, Hucknall, Nottinghamshire.

Mr. W. G. Pye.—The death is announced in his eightieth year of Mr. William George Pye, who founded Pye, Ltd. Mr. Pye, in his earlier years worked at the Cavendish Laboratory, Cambridge, where he was associated with Sir J. J. Thomson, Lord Rutherford and Dr. G. F. Searle. He commenced business as a scientific instrument manufacturer in Cambridge in 1899, and this concern later commenced the manufacture of radio sets. In 1930 he retired, but later took an active interest in a concern now known as Senlac Metal Casements, from which he retired at the beginning of this year.

Mr. S. T. Quilliam.—The death occurred on 15th October of Mr. Samuel Thomas Quilliam, managing director of the Forest City Electrical Co., Ltd., Stretford, Lancs. He was seventy-three years of age.

Mr. L. G. J. Bratt.—The death occurred on 19th October at Budleigh Salterton, Devon, in his ninety-second year, of Mr. Lionel George John Bratt, founder of Bratt-Colbran, Ltd.

Correspondence

Letters should bear the writers' names and addresses, not necessarily for publication. Responsibility cannot be accepted for the opinions expressed by correspondents

Compulsory Registration

THE editorial note on the above subject in your issue of October 14th seems to imply that we have made a claim to which we are not entitled. Much, of course, depends on what is intended by the term "open discussion."

It is a well-known fact that the Electrical Contractors' Association did much useful work in pressing for compulsory registration, particularly at its conferences and by its activities on the National Register of Electrical Installation Contractors, before the Association of Supervising Electrical Engineers actively took up the question in 1936 by appointing a special committee to investigate the position. The report of that committee under the title of "The Case for Compulsory Wiring Regulations and Registration" formed the basis of discussion at public meetings in the main centres of the country, at which, with the exception of the London meeting where a resolution was not put, the principle of a compulsory scheme was approved. It was as a result of this practically unanimous view that the National Committee on Statutory Wiring Regulations and Registration was formed.

While the point you make is well taken, the statement in the *Electrical Supervisor* that "the Association, which, as a result of its published report and the public meetings held, brought into open discussion for the first time the question of compulsory registration . . ." is not, and was not intended to be, an incorrect statement. If the words "open discussion" had been followed by the words "at public meetings," the misunderstanding would not have occurred and my trespass on your valuable space would not have been necessary.

New Barnet
Herts.

A. BRAMMER,
Managing Editor,
Electrical Supervisor.

Technical Education Problem

ALTHOUGH I am only 26, and do not quite come within the "neglected '30's" group, I can endorse the spirit behind "Ab Initio's" letter in the current issue of the *Electrical Review*. To complete the examination requirements of the I.E.E. when I left the Forces I had only to take the "special subject" of Section B (my choice being "Supply"), but I found it necessary to take the Higher National Certificate course and hence could cover only a small portion of the syllabus for the examination which I wanted. Consequently I sat for the H.N.C. examination last June and have only just (4½ months later) been able to get the results. Some speeding up at the I.E.E. would help considerably as the current session of evening classes began about four weeks ago.

One further point regarding the requirements for associate membership is also a thorn in my side—namely, practical train-

ing. It would appear to be almost essential for me to serve a two-year apprenticeship in order to obtain the necessary "piece of paper" without any consideration for the period of my life spent in the Forces or, for that matter, the time before or since then.

"EX-SERVICE."

WHILE agreeing with your correspondent that education facilities for the neglected "30's" are quite out of tune with the times and there is an urgent case for their revision, I would suggest that if some of this class are as proficient as your correspondent states, then rather than wait for a reorganization of college courses they should take advantage of correspondence courses, the study period of which they can adjust to suit themselves.

"SYMPATHETIC."

Fair Trading

IN the editorial columns of the *Electrical Review* of 14th October, a reference was made to Australia's flattering (if somewhat belated) interest in the Electrical Fair Trading Policy and the activities of my Council. The apparent tardiness can be explained by the fact that it is only in the last few months that the legislation of the Commonwealth Government has made it possible for a Fair Trading Code to be operated.

I am pleased to say that my Council has been able to render assistance in this matter to the Electrical and Radio Federation of Victoria and through them the Electrical and Radio Development Association of New South Wales, and although liaison was only established a little over a year ago, a committee has been appointed representing manufacturers, wholesalers and contractors and real progress has already been made in drafting a policy based on the British scheme but adapted to suit local conditions.

It is intended to obtain the full co-operation of all similar organizations throughout the Commonwealth so that the entire electrical industry shall embrace a common trading policy in a similar manner to that obtaining here.

Judged by the benefits which have accrued to our own electrical industry and to the public as users of electrical products, through the operation of the Fair Trading Policy, there will surely go out from this country a wealth of good wishes to those who labour to erect a similar national trading structure in Australia.

A lively interest is also being displayed in the British Fair Trading Policy in New Zealand and South Africa with a view to inaugurating like codes and reports of progress are being awaited with pleasure by my Council.

ARTHUR S. LOWE,
Secretary,
Electrical Fair Trading Council.
London, W.C.2.

Disposal of Fluorescent Tubes

IN the current issue of the *Readers' Digest*, and in certain other journals widely read by people normally out of touch with the technicalities of electrical matters, there appears a fear-inspiring article on the disposal of fluorescent tubes. This matter was raised by the British Press some twelve months ago, and it was then pointed out that the majority of British manufacturers were, even then, well aware of the virulent nature of the beryllium phosphor in open cuts, etc., and had ceased to use it in the manufacture of tubes.

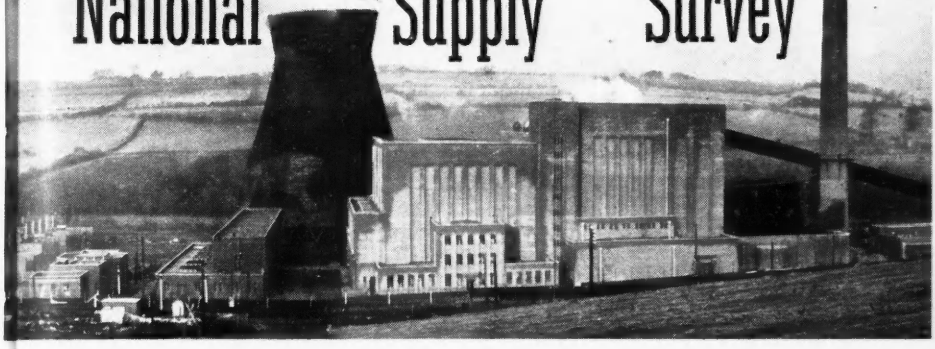
I am surprised that the manufacturers have not more widely advertised this fact, in view of the damaging influence such articles have on potential users of fluorescent lighting.

I understand that our American cousins, with whom the article to which I refer originated, still use the dangerous phosphor. I feel that it would be good publicity if we, who first developed the fluorescent tube, proclaimed our advancement in safeguarding the disposal of tubes, and proved once again that the British make the best.

Yeadon, Yorks. H. BEEVERS.

[The article referred to is a somewhat sensational account of mishaps with broken fluorescent tubes in the United States. The ill effects described are believed to have been due to beryllium compounds, but British makers of fluorescent lamps announced in December last that they had ceased to use these compounds. The three leading American makers, according to the article, have also agreed not to use beryllium compounds in future.—Editors, *Electrical Review.*]

National Supply Survey



ELECTRICAL ASSESSMENT OF THE FOURTEEN AREAS

7. SOUTH WALES AREA

WHEN the electricity supply industry in this country became nationalized last year there was in the South Wales Area a total generating plant capacity of 598 MW in the twenty-three public supply stations. The total effective capacity of these stations was 548 MW. The general overall picture of the generation for the Area is given by the table on page 799, but a few specific observations are worth while. The Upper Boat and Tir John power stations have almost equal plant capacities, amounting together to a little over half the total of all the power stations in the area. Tir John has a point of particular interest in that it is specially designed to consume the very low-volatile fuel from the duff heaps of South Wales. This, no doubt, has a bearing on its designation as a base-load station. Llynfi is another base-load installation consequent on its comprehensive automatic control system. It is a wartime station and the newest of all the stations listed. More than half the stations have individual capacities of less than one megawatt, and with the exception of Penydarren these small stations are all hydro or oil stations. In the calendar years 1947 and 1948 the total kWh generated by all the stations was 2,625 millions and 2,859 millions, respectively.

Although it is outside the South Wales Area boundary the Lydney generating station is operated and maintained by the South Wales Division. The following generating stations are at present under construction in the area: Carmarthen Bay station at Burryport, which is likely to have an ultimate plant capacity of 345 MW, although so far only 225 MW of plant has been sanctioned; Uskmouth station, at Fifoot's Point at the mouth of the River Usk, which will probably consist eventually of two stations "A" and "B," each with a capacity of 360 MW, although only "A" station has so far been sanctioned and is likely to be commissioned in 1951. Further, a 60 MW extension at the Llynfi power station is expected to be completed next year.

The major transmission system does not call for much comment as it is outlined in our specially prepared map, but the following grid substations and their capacities constitute information of considerable importance to such a survey: Ebbw Vale (60 MVA), Lydney Local (40 MVA), Newport (90 MVA), Cardiff (90 MVA), Upper Boat (90 MVA), Kenfig (90

Our title picture shows the war-time Llynfi power station which is the most modern of all the power stations at present operating in the area

MVA), Tir John (106 MVA) and Llanelly (90 MVA).

All the foregoing power stations and the grid transmission systems were absorbed by the South Wales Division of the British Electricity Authority, and the following statutory undertakings were vested in the South Wales Electricity Board: Aberayron & District Electric Supply & Power Co., Ltd., Aberdare U.D.C., Abertillery U.D.C., Ammanford U.D.C., Barry Corporation, Bedwas & Machen U.D.C., Bedwellty U.D.C., Bridgend U.D.C., Caerphilly U.D.C., Cardiff R.D.C., Cardiff Corporation, Carmarthen Electric Supply Co., Ltd., Cwmbran U.D.C., Chepstow Electric Supply & Power Co., Ltd., Ebbw Vale U.D.C., Gelligaer U.D.C., Gorseinon Electric Light Co., Ltd., Llanelly & District Electric Supply Co., Ltd., Llandrindod Wells U.D.C., Maesteg U.D.C., Merthyr Electric Traction & Lighting Co., Ltd., Milford Haven U.D.C., Monmouth Electricity Co., Ltd., Mountain Ash U.D.C., Mynyddislwyn U.D.C., Neath R.D.C., Neath Corporation, Newport Corporation (Mon.), Ogmore & Garw U.D.C., Penarth U.D.C., Penybont R.D.C., Pontardawe R.D.C., Porthcawl Electricity Co., Ltd., Port Talbot Corporation, Pontypool Electric Light & Power Co., Pontypridd U.D.C., Rhondda U.D.C., Risca U.D.C., Swansea Corporation, Shropshire, Worcestershire & Staffordshire Electric Power Co. (part only), South Wales Electric Power Co., Tredegar U.D.C., West Cambrian Power Co., Ltd., and West Gloucestershire Power Co., Ltd. (part only).

Of the following non-statutory undertakings in the area the Ely Valley undertaking has been operated by the Board from 1st March, 1948, and the Crymmych and Whitland undertakings have since been acquired: Clynderwen, Ely Valley Lighting Co., Llanddewi Brefi, Llandyssilio, Llangattock, Llansawel, Llanstephan, Laugharne, Maenclochog, Mathry, Pontrhydfendigaid, Rhymney & Abertysswg, St. Davids, Yspytty Ystwyth, Crymmych and Whitland.

The vesting undertakings were re-

sponsible for the sale of about 2,251.5 million kWh to the 436,000 (about) consumers in the year 1948/9, with a summated maximum demand of 473 MW.

In this Area, however, the number of consumers has a very different relationship to the load and consumption from that of the other Areas we have so far dealt with, for whereas in all the other

The South Wales coal fields exercise a great influence upon the entire electrical picture. "Land Utilization" indications are also given in the accompanying map which was specially prepared by the *Electrical Review*. Urban areas are shown white, heath and moorlands in a red tint whilst farming and agricultural areas are shown in green

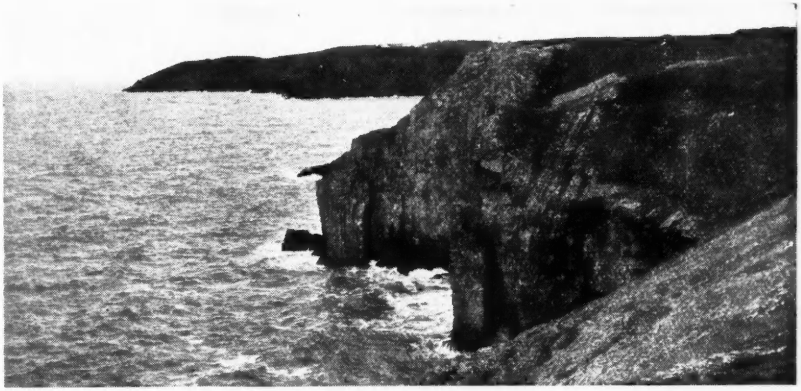
Areas the dominant load is the domestic one, here we have a preponderance of industrial load as shown by the following rough load analysis (based on consumption): Industrial and small power load, 80 per cent; domestic load, 15 per cent; commercial load, 4 per cent; and combined farm, public lighting and traction loads, 1 per cent.

Obviously, this overwhelming industrial load is the key to the load distribution picture for the Area, and we feel that this can be presented in no better way than by the following historical and geographical outline of the South Wales industries. But first we can add some interest to the analysis by the following breakdown of the industrial load: Iron and steel, 37 per cent; chemical industry, 25 per cent; collieries 23 per cent; and miscellaneous, 15 per cent.

The basic industries of South Wales are now steel and coal. The ferrous metals had an early start, iron being worked by the monks at Margam in the 13th century and smelted in Caerphilly Castle grounds in the 14th century. Wood was the fuel used. Later, the industry started on the northern and eastern outcrops, e.g., Aberdare, Merthyr, Tredegar and Pontypool, where there were, at first, ample supplies of wood and the ore was near the surface. Later, shortage of wood for charcoal prompted a search for substitutes and it was discovered that coal (coke) could be used for smelting.

As coke is best produced from bituminous coal, and as limestone is needed for fluxing, iron smelting grew rapidly on the northern and eastern outcrops where the three basic materials were readily to hand, the coal and iron ore being very near the surface. Furthermore, the richer ores were towards the east, giving reason for the concentration in the eastern district. Methods of using anthracite for smelting were evolved in due course, leading to the establishment of iron works, and later tinplate works, in the Llanelly and Ystradgynlais districts.

Cardiff is one of the few Ordnance Survey "dense urban" places in the Area (*Aerofilm photo*)



The coast line of Pembrokeshire is probably unsurpassed in any other part of Great Britain

The situation was changed when the Bessemer and "open-hearth" processes for making steel were discovered. The ores of the northern outcrop were unsuitable owing to their high phosphorus content. This meant the use of imported ores, and though, at first, they were carried up the valleys, it was found cheaper to carry the coal, limestone and millstone grit for the linings down to the ports where new works were established. This latter tendency is now predominant, the largest concentration of steel works being in the Llanelly, Swansea, Port

GENERATING STATIONS OPERATED BY THE SOUTH WALES DIVISION

Station.	Previous Owners.	Type of Station.	Installed Capacity-MW	Effective Capacity MW S.O.	Type of Operation.
Llanelly ...	Llanelly & District Electric Supply Co.	Coal	28	25	Two shift.
Tir John ...	Swansea Corporation	Coal	147.75	134	Base load.
Upper Boat ...	South Wales Electric Power Co.	Coal	155	145	Three shift.
Llynfi ...	South Wales Electric Power Co.	Coal	60	56	Base load.
Cardiff ...	Cardiff Corporation	Coal	87.6	83	Three shift.
Newport ...	Newport Corporation	Coal	89.25	84	Three shift.
Lydney ...	West Gloucestershire Power Co.	Coal	17.635	14	Two shift.
Haverfordwest	West Cambrian Power Co. ...	Diesel	4.975	4	Peak load.
Bridgend ...	Bridgend U.D.C.	Coal	2	1	Peak load.
Penarth ...	Penarth U.D.C.	Coal	1.52	1	Peak load.
Pontypridd ...	Pontypridd U.D.C.	Refuse and Coal ...	1.8	1	Refuse—base load, coal—peak load.
Penydarren	Merthyr Electric Light & Traction Co.	Coal	0.52		Peak load.
Pontycafnau	Merthyr Electric Light & Traction Co.	Hydro	0.19		Base load.
Cyfarthfa ...	Merthyr Electric Light & Traction Co.	Hydro	0.10		Base load.
St. Clears ...	West Cambrian Power Co. ...	Diesel	0.113		Peak load.
Aberayron ...	West Cambrian Power Co. ...	Diesel	0.1		Peak load.
Newquay ...	West Cambrian Power Co. ...	Diesel	0.035		Peak load.
Monmouth ...	Monmouthshire Electricity Co., Ltd.	Hydro	0.11		Base load.
Milford Haven	Milford Haven U.D.C.	Diesel	0.815		Peak load.
Llandyssul ...	West Cambrian Power Co. ...	Diesel and Hydro	0.139		Diesel—peak load, Hydro—base load.
Llandrindod	Llandrindod U.D.C.	Diesel	0.231		Peak load
Lampeter ...	West Cambrian Power Co. ...	Diesel	0.4		Peak load.
Carmarthen ...	West Cambrian Power Co. ...	Diesel	0.2		Peak load.
		Totals	598.483	518	

Talbot region where important expansion schemes at Margam and Trostre are under construction.

Headquarters of the South Wales Electricity Board at St. Mellons, Cardiff

Though small quantities of coal were shipped in the very early days from Llanelly and Swansea, some even being sent to Cardiff, coal mining in South Wales was originally a subsidiary to iron smelting. The steam engine, both ashore and afloat, completely altered the demand, and in view of the high qualities of South Wales coal, the mining industry expanded rapidly, justifying increased railway and harbour facilities. Ample reserves of many varieties of coal and anthracite exist, and it can be assumed that this, and the development of the steelworks and auxiliary industries, will assure the area of its share in the future prosperity of the country.

Copper bearing ores are not local to South Wales, but refineries were set up at Neath in 1584 to deal with Cornish ore, due to the depletion of Cornish wood and to serve as return loads for coal boats from Swansea and Neath. Wood was used for smelting, but on the revival of the industry in the beginning of the 18th century it was based on the use of coal deposits in the Neath region. The growth of copper refining led to the concentration of the chemical industry near Swansea, which also had the shipping facilities to deal with imported ores originally from Cornwall and Anglesey, but later from Spain. Most of the zinc and nickel refining in this country is also concentrated in this area. The tin plate industry was started in 1665 in Pontypool. It was discovered, however, that pickling with sulphuric acid was advantageous, and as a result of this the industry partly migrated to Swansea and Llanelly where supplies of acid were available from the nearby chemical industries, together with ample supplies of iron and coal. Tin ores are not native to South Wales. The metal is, therefore, imported from Malaya, Algeria, Nigeria, etc. Galvanized sheeting is also made in both the Western and Eastern tinplate districts.

The more recent chemical industry developments at Newport, Barry and Port Talbot are in connection with plastics, coal derivatives, carbides, etc.,

South Wales is famous for its castles—Careg Cennen

with which may be coupled the oil refinery between Neath and Swansea.

As a result of world changes in trade, and the tariff policies of certain countries, exports of coal, tinplate and steel decreased. To combat the resulting unemployment and to avoid the dependence on a single industry, a more balanced set of industries has been encouraged to settle in South Wales. Whilst a number of these are concentrated in the Trading Estates, others, such as motor accessories, clothing, watch-making, etc., are spread throughout the Area, and, in general, have not been indicated on the map. Among the larger of these newer industries are aluminium and nylon, both of which require the large blocks of power which can be most conveniently generated in reasonable proximity to the coalfields.

Farming, fishing and the tourist industries also provide their share of the wealth of the Area. The main centre of the fishing industry is at Milford Haven, one of the leading fishing ports in the country.

Besides meeting local needs for milk there is a substantial production of crops in the less elevated districts. The higher lands are more suitable for sheep which are reared in considerable numbers.

The tourist industry is growing in importance as more people come to appreciate the exceptionally beautiful coastline and the mild weather of South West Wales. For those with other tastes the inland spas at Llandrindod, Builth, etc., provide good centres convenient for some of the finest salmon fishing in the country.

The population of the Area (1,969,000) is very unevenly distributed, most of it being concentrated in the valleys running north to south through the coalfields, in Newport and Cardiff, and in the coastal strip from Port Talbot via Swansea to Llanelly. The concentrations of population follow the concentrations of industry referred to, and naturally the electrical load is similarly distributed.

This view near Morriston is typical of the general industrial portions of the South Wales Area

The greatest concentrations of load occur as follows: The district between Newport and Pontypool; Cardiff; the coastal strip from Bridgend to Neath; Neath, Pontardawe and Clydach District; Swansea, Llanelly and Pontardulais District, and in the aforementioned valleys, particularly at Ebbw Vale and Merthyr Tydfil.

Though efforts have been made to establish new and diverse types of industries throughout the Area, in many cases the power required by these industries is not comparable with that required by the more basic industries such as coal, steel making, tin-plate and chemicals, with which might be bracketed aluminium and nylon. As a consequence the distribution of load is not likely to alter appreciably, except perhaps that the concentration on the coastal areas may be even heavier, owing to the importance of water transport, for instance, at the new steel works at Margam, near Port

Talbot and also at Trostre, near Llanelly.

The load from coal mines is spread over many units though it appears that the Coal Board's policy may be, in time, to concentrate on larger units such as the recently announced proposals in respect of Maerdy in one of the Rhondda Valleys. The less densely populated parts of the Area are also moderately well served by lower voltage lines, though there is considerable leeway still to be made up. With the amalgamation of the various systems previously in existence it will be possible to join various sections at some future date. This type of development should increase the reliability of supply and at the same time enable other areas to be opened up.

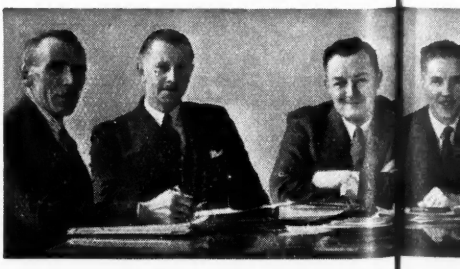
The following table of some of the larger customers and their loadings and consumptions will contribute considerably to the broad picture of the load conditions of the area: —

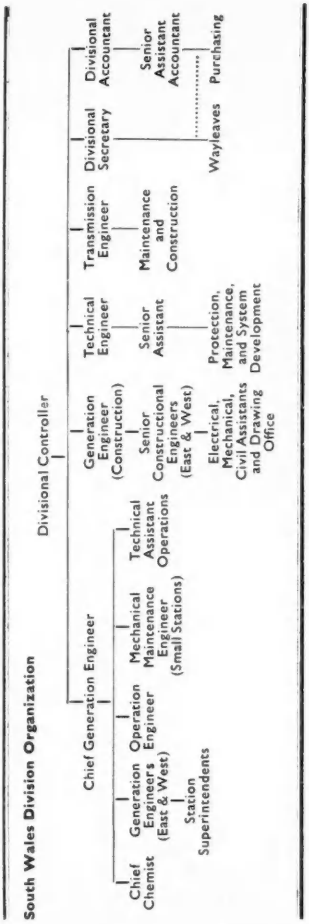
Consumer	Industry or Operations	Maximum demand MW	Annual consumption Millions kWh
British Industrial Solvents, Ltd., Kenfig.	Manufacture of carbide	55	334
British Nylon Spinners, Ltd.	Manufacture of nylon yarn.	3 MVA (now) 9 MVA (ultimate.)	24
I.C.I. Ltd., Dowlais	Chemical production.	13.6	98
National Oil Refineries Ltd., Llandarcy.	Oil refining, storage and distribution.	5.7	35
Northern Aluminium Co., Ltd., Rogerstone	Aluminium rolling.	12.3	70
Richard Thomas & Baldwins, Ltd., Ebbw Vale.	Steelworks and rolling mills; manufacturing tinplate and steel sheets.	38.7	165
Whitehead Iron & Steel Co., Ltd., Newport, Mon.	Steel rolling.	9.7	30
National Coal Board.			
Lady Windsor Colliery (complete electrification).	Coal mining.	3.2	10.3
Parc & Dare Colliery (60-70 per cent. electrification steam winding and compressor).	Coal mining.	2.3	11.3

One of the most interesting matters arising out of the amalgamation of a large number of undertakings is the problem presented by the inevitable diversity of tariffs with regard to both form and actual price, and this is particularly the case in South Wales because of the extreme diversity in distribution and concentration of the population. The proportion of prepayment consumers in the Area exceeds 45 per cent, and no doubt it was partly due to this that flat rates for various purposes were most frequently adopted, some of the former undertakings not even quoting alternative two-part tariffs. In view of the present tendency towards adopting a universal two-part

Tariff	West Country Seaside Town	Valley Town
Lighting—Flat rate.	10d. per kWh.	1st 500 kWh/qtr. 2½d. per kWh. remainder 2d. per kWh.
Heating and cooking.	1½d. per kWh. plus 12½ per cent.	¾d. per kWh.
Domestic two-part annual fixed charge.	25 per cent. rateable value.	15 per cent. r.v. up to £20 r.v. (min. £2.). 12½ per cent. r.v. over £20 r.v. (min. £3 4s.).
Running charge.	1d. per kWh.	¾d. per kWh.
Power	1st 42 kWh qtr h.p. installed, 3d. per kWh.	1st 118 kWh qtr. per kW 2d. per kWh.
	2nd 42 per kWh qtr h.p. installed, 2½d. per kWh.	Next 55 kWh/qtr. per kW 1.8d. per kWh.
	3rd. 42 kWh qtr h.p. installed, 2d. per kWh.	Next 55 kWh qtr. per kW 1.6d. per kWh.
	Remainder 1½d. per kWh. (above plus 12½ per cent.).	And so on to 1.2d. per kWh.

The Division "Executive Team." Left to right—Mr. D. S. Chisholm, Divisional Accountant; Mr. C. Morley New, Divisional Transmission Engineer; Mr. E. J. Turner, Divisional Secretary; Mr. K. H. Hughes, Senior Administrative Assistant; Mr. H. V. Pugh, Divisional Controller; Mr. E. Hywel Jones, Chief Generation Engineer (Operation); Mr. T. H. Wood, Generation Engineer (Construction); and Mr. G. Minter, Electrotechnical Engineer





tariff or block rate the high proportion of prepayment meters and the leaning towards flat rates render the situation extremely difficult.

New districts having convenient boundaries from the electrical and administrative points of view have been formed, in many cases by an amalgamation of up to three vested undertakings. Such a change was necessary, in order to afford units of a reasonable size and in view of the often inconvenient local authority boundaries, particularly in the industrial valleys where such boundaries frequently cut through apparently homogeneous communities. As a result, up to three distinct sets of tariffs can exist in one quite reasonably sized district. This, of course, increases the difficulty of administration and invites adverse public comment. The table of actual tariffs on the opposite page gives some idea of the wide diversity referred to.

The following showrooms or service centres are available to all existing and potential consumers. They are arranged in Sub-Area order for easy presentation.

Western Sub-Area:—Aberayron, Cardigan, Carmarthen, Fishguard, Haverfordwest, Lampeter, Llandilo, Milford Haven, Newcastle Emlyn, Neyland, Pembroke, Pembroke Dock, Tenby and Tregaron.

West Central Sub-Area:—Ammanford, Brynamman, Cymmer, Gorseinon, Llanelly, Penclawdd, Porthcawl, Port Talbot, Pyle (near Bridgend), Swansea and Ystradgynlais.

Central Sub-Area:—Aberdare, Abertridwr, Bargoed, Barry, Bedwas, Blackwood, Cardiff (three), Cowbridge, Ferndale, Maesteg, Merthyr Tydfil, Mountain Ash , Ogmore Vale, Penarth, Pontycymmer, Pontypridd and Tonyrefail.

Eastern Sub - Area:—Abergavenny, Abertillery, Blaina, Brecon, Builth Wells, Chepstow, Ebbw Vale, Hay, Llandrindod Wells, Monmouth, Newbridge, Newport (Mon), Pontnewydd, Pontypool, Rhayader, Rogerstone and Talgarth.

All the material, conditions and activity indicated in the foregoing are being dovetailed into the two co-operative organizations responsible for the execution and administration of public electricity supply in the Area. The Board is well established in its headquarters at St. Mellons, Cardiff, the headquarters of the former South Wales Power Co., and the Division now has its second temporary headquarters at Cardiff (Pengam Moors) Airport.

On the Board side the Area is controlled by the Area Board, assisted by a Consultative Council. Directly responsible to the Board are the chief executive officers and the Sub-Area managers. In each Sub-Area is a similar organization, the Sub-Area manager being assisted by the Sub-Area engineer, commercial officer, accountant and an administrative assistant. The Districts forming each Sub-Area are controlled by a District commercial officer, District engineer and chief clerk. These officials are responsible for the day-to-day operation of their Districts but, of course, are subject to guidance by the Sub-Area organization.

We are able to present the main members of the Divisional organization by a "family tree" and also to publish a group photograph of the Division "Executive Team."

The Area served by these organizations consists of the southern half of Wales and Monmouthshire, the boundary running east from just below Aberystwyth to the border near Presteign) and thence in a southerly direction via Hay to Chepstow. The southern and western borders are formed by the Bristol Channel and Cardigan Bay.

Though the coalfield district is largely industrialized the remainder of the Area is of an entirely different character. This more rural aspect is not confined entirely to Pembrokeshire, Radnorshire and Carmarthenshire, but extends to a large part of Glamorganshire and Monmouthshire. In the former county, for instance, the coastal strip extending several miles inland (the Vale of Glamorgan) between Porthcawl and Cardiff is a predominantly agricultural district. This characteristic repeats itself to the east of Cardiff.

Whilst parts of the country have been subject to indiscriminate development and lack of planning, some of the larger towns such as Cardiff have developed on excellent lines. Builth Wells and Carmarthen are typical of a number of country towns in the Area, many of the claiming to have associations with such famous figures of history as Owain Glyndwr. The south-western part of the Area is also famous for its castles, though it must be confessed that the situation of the one

A number of the new "balancing" industries is concentrated on the Treforest Trading Estates

Builth Wells is typical of a number of historical towns in the area (*Aerofilms photo*)

illustrated is somewhat exceptional. The coast line of Pembrokeshire and the Gower are probably unsurpassed for unspoiled beauty in any other part of Great Britain. Under the new planning proposals a large part of the Area will become a National Park which will include Brecon Beacons, whilst a considerable part of the coastal section will be conserved.

The Area covers about 4,556 sq miles and is thus tenth of all the National Areas in order of size. A study of the Ordnance Survey maps reveals how greatly the South Wales coalfield, with its associated basic industry—iron and steel—influences the entire electrical picture. The coalfield is spread over about a fifth of the area, extending from Burry Port in the west to Pontypool in the east, and from, say, Llandybie and Brynmawr in the north to, say, Swansea and Caerphilly in the south.

On the "Population Density" map and again on the "Land Utilization" map we see within these limits unique markings of very roughly south to north parallel lines corresponding to the valleys. In one case they represent the higher population densities in terms of "suburban and industrialized rural" (400 to 6,400 to 25,000 persons per sq mile). In the other case the markings represent "chief urban areas." The chief point about the "Types of Farming" map is the great amount of "land of small agricultural value" corresponding roughly with the coal field in the South and extending centrally over the mountains to the northern boundary of the area. A belt of dairying land hugs the south coastal boundary. Corresponding with the "land of small agricultural value" are the "heathland, moorland and rough pasture" marking on the "Land Utilization" map and pale colourings "virtually uninhabited" and "sparse rural" on the "Population Density" map.

Consideration of all these features of the area led us to adopt a combination of the coal field and "Land Utilization" as the characteristic background of the specially prepared map accompanying this article.

We are indebted to Mr. L. Howles, chairman, South Wales Electricity Board, and to Mr. H. V. Pugh, controller, South Wales Division, British Electricity Authority, for their co-operation in the investigations which have led to the publication of this article.

Use of Analogies

I.E.E. Scottish Centre Chairman's Address

IN his augural address as chairman of the Scottish Centre of the Institution of Electrical Engineers last week Prof. M. G. Say (Heriot-Watt College, Edinburgh) spoke of the value, uses and potentialities of analogies in education, development and research.

Analogy has begun to reverse and whereas electrical phenomena were formerly described in terms of the mechanical or hydraulic, problems in mechanics, heat transfer and acoustics have more recently been solved by conversion into their analogous electrical counterparts. With dynamical and acoustic problems, for instance, a mechanical or acoustic chain can often be converted into an equivalent circuit and solved by electrical methods.

Interchangeable Mathematics

The more useful and important analogies are so because of their common bases of interchangeable mathematics. In some cases the mathematical formulations are identical. These "complete analogies" are most useful because the behaviour of the electrical network analogue is known, or can be measured easily, it then being only necessary to state the answer in the terms appropriate to the original problem.

The electrical art has so permeated other branches of engineering that problems may involve the coupling between mechanical-electrical or acoustic-electrical parts of the same device as in sound reproduction systems and servomechanisms with electric drive or control. Reduction to a single electrical equivalent is then a valuable simplification.

The term "complete analogy" is more applicable to mathematical similarity than physical similarity and because there are inevitable assumptions in the equations of behaviour, not necessarily of the same kind or order in the two systems compared, the parallelism must not be taken too far.

A valuable feature of analogy is that by its aid a line of reasoning may sometimes be extended into unexplored territory. While there are strictly no complete analogies between physical systems there are partial ones. These may be found between electric circuits, both lumped and extended, mechanical systems of translation and rotation, the flow of liquid along pipes and acoustic systems. Analogues can also be found in a variety of unlikely pairs of systems.

Professor Say continued by pointing out and discussing in detail some of the more complete analogies between the systems which are of most interest to electrical engineers. The heat developed by losses in electrical resistance, mechanical friction and acoustic resistance may be compared if, by analogy with the lumped electric circuit concept, the mechanical and acoustic systems are also considered as made up of separate elements. In a similar fashion the energy stored magnetically in an inductive element can be compared with the kinetic energy in a mechanical translational or rotational system and the energy storage effect associated with acoustic systems. Examination indicates that if the four systems are appropriately arranged their equations of behaviour will have identical form, differing only in coefficients so that a solution for one covers all.

Surge Propagation Parallel

The propagation of a surge on a transmission line has often been compared to the starting of a goods train with the truck masses and the buffer springs providing the essential kinetic and potential energy storage elements. In so far as a line can be represented by a chain of a finite number of similar elements it can also be represented by the appropriate analogue arranged in a like way.

Mentioning the rubber strip waveguide analogue Prof. Say introduced and spoke at some length on the subject of field analogies, in which stretched rubber membranes have played a very useful part. He then referred to the analogies which can be applied to servomechanisms passing on to coupled tuned circuits and discussing a power system analogue.

BEAMA Catalogue

MR. HAROLD WILSON AT "LAUNCHING CEREMONY"

A VERY distinguished gathering of about 300 attended a luncheon at the Savoy Hotel, London, on 19th October to mark the publication of the "BEAMA Catalogue" to which reference was made in last week's *Electrical Review*. Mr. H. W. Bosworth, Chairman of the Council of the British Electrical and Allied Manufacturers' Association, presided and the principal guest was Mr. Harold Wilson, President of the Board of Trade.

In proposing the toast "Exports and the Electrical Industry," Mr. Bosworth briefly outlined the Association's history and activities. It was incorporated over forty years ago, he said, and now had over 360 members who represented about 80 per cent of the capital employed in the industry. The British electrical industry employed over half a million people and in 1938 was the largest exporter of electrical goods in the world. In 1948 it exported twice as much as in 1938 and this year the rate was over two-and-a-half times the figure, being at the rate of £120 million a year. It had exceeded its Board of Trade export targets and could have done more but for overseas restrictions.

Mr. Bosworth spoke of the Association's overseas branches and its participation in trade missions, referring particularly to the mission now in Canada trying to overcome difficulties in connection with Canadian specifications and regulations.

Turning to the Catalogue, Mr. Bosworth said that the first edition of 13,000 copies had cost the electrical manufacturing industry upwards of £50,000. For the first time there would be available a comprehensive catalogue of electrical products which it was hoped would be a standard book of reference throughout the world.

Giving instances of the many difficulties confronting exporters the speaker asked the Press to help to direct public opinion towards a lessening of these hindrances. He also appealed to the Press to help in establishing the slogan, "If it is electrical Britain can make it"; to consulting engineers to use standard products and simplify specifications and testing; to trade and Government officials to become familiar with the Catalogue to be able to advise overseas buyers; and to all employed in the industry, "from the youngest apprentice down to the managing director," to work all the hours of which they were capable and remove all prejudices and restrictive practices. A special appeal was made to those responsible for negotiating trade agreements at the highest levels that they should include a large proportion of electrical equipment in these agreements; that all help should be given to

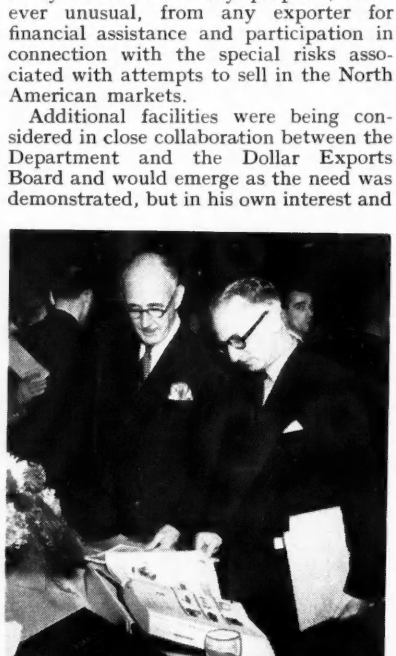
Mr. H. W. Bosworth at the microphone. On his right are the President of the Board of Trade, Sir George Nelson, Sir Archibald Rowlands (Ministry of Supply), and Sir Harold Hartley (World Power Conference); on his left is Lord Citrine (chairman, E.E.A.)

the light electrical industries to ensure a balanced trade; and that they should demand the removal of some of the obstacles to our export trade.

Mr. Bosworth concluded by thanking all those concerned with the production of the Catalogue, particularly Iliffe and Sons, Ltd., who undertook the production and printing and were distributing it for the BEAMA Publicity Committee.

Mr. Harold Wilson replied to the toast. He said that exporters to the North American market should know that it was now possible to share their risks and responsibilities with the Export Credits Guarantee Dept. which had had a long and successful experience in assisting export trade. The Department stood ready to entertain any proposal, however unusual, from any exporter for financial assistance and participation in connection with the special risks associated with attempts to sell in the North American markets.

Additional facilities were being considered in close collaboration between the Department and the Dollar Exports Board and would emerge as the need was demonstrated, but in his own interest and in the interests of the dollar drive the exporter was advised to move quickly.



Mr. C. E. Wallis, chairman of Iliffe & Sons, Ltd., the publishers, and Mr. C. W. Frerk, manager of Iliffe's Directory Publications Dept., examine a copy of the BEAMA Catalogue

There was too much of a tendency, Mr. Wilson said, to attribute our dollar problem to causes lying within this country—to lack of effort and sales promotion, but we were the only country in Western Europe which had increased the proportion of dollar imports paid for by exports to the dollar areas.

Export Achievements

In sympathy with the Chairman's appeal to the Press, Mr. Wilson said he would like to give one or two facts. In the electrical machinery group the monthly rate of exports in the first half of this year was £3,500,000, seven times by value and something like three times by volume the 1938 figures. Exports by the industry to the ultra-hard-currency countries were, in the first half of this year, at the annual rate of £3,750,000 compared with £600,000 a year before the war. Considerable progress had been made in all the hard-currency markets of Central and South America and they were looking forward to increased exports to the Argentine, particularly if the trade agreement with that country worked out as it should.

Import restrictions had been the ceaseless concern of the Government, the Board of Trade and other Departments and our representatives in the successive negotiations with South America.

In the Argentine the Government had been at great pains to try to ensure that import licences were issued and that remittances in respect of export claims were promptly met. They could not claim to have yet had full success but that was not their fault.

The recent announcement of extensive relaxations of our own import restrictions on a wide range of goods could be taken by the whole world as an earnest of this country's desire to encourage, play a part in and, indeed, give the lead in, a general liberalization of world trade.

Even after devaluation no one would regard the United States market as lying wide open to exports of electrical goods, although in one or two particular fields we should have great hopes of increasing our exports. But in Canada a tremendous market was open if exporters would tackle the problems before them with vigour and determination.

Appliance Testing

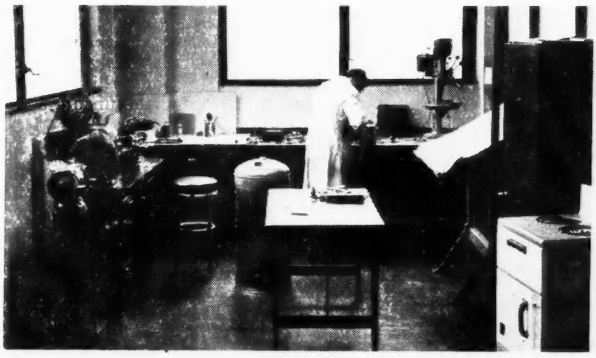
PROGRESS OF E.D.A.-B.S.I. SCHEME

IT was reported in the *Electrical Review* of 20th February, 1948, that in conjunction with the British Standards Institution the British Electrical Development Association had set up a Testing House for electrical appliances. Responsibility for this rested with an Advisory Committee on Electrical Appliances and Accessories of which Mr. F. Newey (now deputy chairman of the Yorkshire Electricity Board) was, and is, chairman.

At the time it was stressed that the Committee's aim was to eliminate unsatisfactory apparatus rather than to approve sound appliances. The method of procedure was to invite the public to send to the Testing House any appliances which they considered to be unsafe. If the Committee decided that these appliances were in fact improperly designed or made, the manufacturers were approached with a view to securing their co-operation in remedying defects. The Committee also undertook to examine appliances before they were actually marketed to ensure that they met safety requirements.

The Committee has now issued a report upon its activities during the past eighteen months. In the first place a folder was produced drawing the attention of manufacturers and others concerned to the existence and functions of the Testing House. This drew a large number of inquiries from electricity supply authorities, wholesalers and contractors and many appliances were submitted for test.

Altogether 69 cases were submitted but of these 23 were not pursued for good reasons. Complaints regarding apparatus numbered 34; in three cases the apparatus was found to be safe and in 18 it was adjudged unsafe. In ten instances the manufacturers agreed to modify or withdraw the condemned appliances, two are still considering the criticisms and two (one of whom subsequently went into liquidation) "resisted." A balance of 13 cases is still in hand.



Part of the E.D.A.-B.S.I. Testing House for electrical appliances

In twelve instances manufacturers submitted samples; in one no objection was raised, eight necessitated modification, one was adjudged suitable for limited application and two are still under consideration.

The Committee concludes from its experience that a high proportion (85 per cent) of complaints were substantiated and that in almost every case manufacturers co-operated in rectifying defects in design or construction. An analysis of 15 representative cases shows that in 12 there was faulty mechanical design, in eight the earthing arrangements were unsatisfactory, eight were defective in electrical design and in four instances unsuitable materials had been used. Some of these appliances had faults under more than one head; one electric fire was defective in all respects.

There is an international aspect of the

Committee's activities. It has become a member of the International Commission on Rules for the Approval of Electrical Equipment (known as the "C.E.E.") which is composed of national organizations dealing with the safety aspect of electrical equipment. The joint secretaries of the Committee, Mr. J. I. Bernard (E.D.A.) and Mr. J. F. Stanley (B.S.I.) are the official delegates to the meetings of the C.E.E. To deal with the documents circulated by the C.E.E. a number of expert panels have been formed under the auspices of the B.S.I. The C.E.E. has sent draft test specifications to its member bodies and the B.S.I. panels have been active in reviewing them and forwarding proposals for consideration. At recent meetings in Oslo the British delegates, with the assistance of experts nominated by the B.S.I. panels, succeeded in securing agreement on various modifications to suit British practice in draft international test specifications for motor-operated appliances, cooking and heating equipment, miniature fuses, plugs and sockets, lampholders and electric fences.

The autumn conference of the C.E.E. is now being held in London (up to 2nd November) on the invitation of the Committee—the first to be held here.

At a Press conference last week, at which lay newspapers and journals were represented, Mr. Newey explained the purposes and activities of the Committee and appealed for publicity. He stressed the fact that electrical accidents in the home were extremely rare having regard to the widespread and growing use of electricity. He took the opportunity of asking the Press to warn the public against the use of portable appliances in bathrooms and "amateur" wiring.

It should be said that any appliance considered to be defective should be sent to the secretary of the Advisory Committee on Electrical Appliances and Accessories, 2, Savoy Hill, London, W.C.2.

The Testing House

Mr. R. Harvey is in charge of the E.D.A. Testing House. Priority in attention is given to makers' prototypes in order to avoid holding up production, and then to other appliances, often sent in by members of the public, in order of their apparent dangerous qualities. Reports, usually illustrated by curves and, where desirable, by X-ray photographs, are drawn up after thorough investigation, but the scope is restricted to pointing out the faults revealed, thus avoiding the possibility of benefiting newcomers to the industry by suggestions for improvements that may be derived from the experience of well-established concerns.

Details of the reports are secret to the Advisory Committee. In view of the diversity of the appliances submitted and also delay in delivery of the instruments, improvization of testing equipment often taxes the ingenuity of those responsible, especially in connection with prototypes for which cut-and-dried methods are often unsuitable.

Laboratory Equipment

Features of the laboratory at present include the following: A 30-A transformer giving 0-260V in 10V steps by means of a trans-step transformer with adjustments to the mains supply voltage on the "Variac" principle. Voltmeters and wattmeters for load adjustments and ascertaining leakage current up to 1A. Flash testing, hot, up to 2,500V on load. Thermo-couples, made in the Testing House for all temperature measurements and calibrated in millivolts. Four-circuit recording millivolt meter, which allows 15 sec to each circuit alternately. Thermostatically controlled oven in which electrical contacts are maintained at 250 deg C. Asbestos table with thin brass discs let in at 35 points, each connected to a thermo-couple for indicating heating effect of electric fires on a floor. Concrete wall with recess for taking built-in fires and equipped with thermostats. Means of testing thermostats with particular reference to blankets, to ascertain whether they fail through remaining closed or, the "right kind of fault," through remaining open. Device for simulating rough usage of heating pads.

There is also a workshop containing a lathe, drill and emery wheels, all motor driven. The E.D.A. Testing House carries out work not only for the A.C.E.A. but also when required for Area Electricity Boards. In the latter case efficiency tests as well as safety tests may be undertaken.

Overseas Electrical Trade

RECOVERY OF EXPORTS IN SEPTEMBER

AFTER the lower figures recorded in the holiday months of July and August, electrical exports during September were again at a high level. With a total value of £10,808,596, they were not far short of the June total of £11,034,248, the second best on record. September, however, contained 26 working days compared with 25 in June (allowing for Whit Monday). With regard to devaluation, the *Board of Trade Journal* comments that the changed rates are unlikely to be reflected in the September accounts.

Details of last month's electrical exports given in Table I reveal a notable expansion in shipments of telegraph and telephone apparatus which, at £1,716,302, compare with £964,583 in September last year; indeed the value is one of the highest yet recorded in this section. In the nine months of the current year the aggregate value of exports of this kind was £11,645,822, compared with £8,324,972 in the corresponding period of last year; South Africa (£2,234,631) and Australia (£2,509,454) were the chief customers for this equipment.

Last month's exports of telegraph and telephone wire and cable (£1,002,869) were also at a considerably higher level than usual, the comparative figure for September, 1948, being £647,557. The greatest improvement in cable exports in the nine months of this year is, however, to be seen in other types—notably paper insulated (£6,744,700 compared with £5,664,185 up to the end of September last year). India has been the best

TABLE I.—ELECTRICAL EXPORTS

Class	Sept., 1949	Sept., 1948
	£	£
Telegraph and telephone wires and cables (submarine)	98,598	19,315
Ditto, not submarine	904,271	628,242
Wires and cables, rubber insulated	333,726	391,681
Ditto, cotton, silk or artificial silk insulated	54,320	76,234
Ditto, enamel, glass or asbestos insulated	49,056	27,415
Ditto, paper insulated	757,379	747,871
Ditto, other	111,915	83,296
Commercial radio apparatus	340,845	132,767
Domestic radio apparatus	239,905	300,646
Telegraph, telephone and signalling apparatus	1,716,302	964,583
Radio loudspeakers	22,904	18,890
Sound reproducing apparatus components and parts, other than cinematograph apparatus	278,142	275,253
Other radio, etc., apparatus	68,789	48,151
Radio valves	169,286	161,610
Electric lighting carbons	13,934	12,739
Lamps, not exceeding 24 V	22,682	22,997
Discharge lamps	48,161	21,735
Other lamps	60,045	84,788
Other lighting apparatus	366,665	398,201
Primary batteries	81,555	64,052
Accumulators for motor vehicles	149,370	102,500
Ditto, traction	14,410	2,769
Ditto, radio	6,152	15,581
Other portable accumulators	66,231	30,694
All other accumulators	45,686	33,645
Parts and accessories	61,229	69,837
Cooking appliances	62,732	174,604
Heating appliances	41,227	66,011
Parts and accessories of cooking and heating appliances	34,114	43,908
Flat irons	31,520	30,669
Commercial electrical instruments	98,541	88,421
House service meters	136,557	160,388
Time recorders and time switches	20,559	12,567
Other electrical instruments	88,358	70,975
Electro-medical apparatus (not X-ray)	29,811	39,259
X-ray apparatus, tubes and parts	64,263	66,652
Permanent magnets	12,269	13,282
Insulating cloth and tape	60,966	52,302
Other insulating materials	68,636	80,551
Unclassified goods and apparatus	385,946	333,020
Generators, up to 200 kW	857,379	286,069
Ditto, over 200 kW	170,535	165,757
Ditto, parts	87,468	227,599
Motors, railway and tramway	6,552	459
Ditto, other, up to ½ h.p.	49,405	127,200
Ditto, from ½ to 1 h.p.	40,775	59,172
Ditto, from 1 to 250 h.p.	477,945	410,000
Ditto, over 250 h.p.	28,228	15,827
Ditto, parts	104,057	67,424
Converting machinery	10,818	3,535
Transformers, including coils	578,307	243,469
Rectifiers for power house use	42,179	20,199
Motor starting and control gear	166,731	137,912
Switchgear and switchboards (not telegraph or telephone)	722,474	680,568
Other electrical machinery	40,170	39,184
Vacuum cleaners and parts	122,449	118,764
Other electrically operated portable appliances	86,062	54,229
TOTAL	10,808,596	8,625,378

customer for cables other than rubber insulated, with a total of £2,070,052 against £938,333 in January-September, 1948.

Present difficult conditions in overseas markets have resulted in reduced exports of cooking and heating appliances as well as electrical instruments and the over-

value of exports of this kind was £857,379 against £286,069 in September, 1948, while for the nine months up to 30th September the total reached no less than £6,141,289—nearly three times as much as in the corresponding period of last year.

Imports of electrical equipment in

TABLE II.—DISTRIBUTION OF ELECTRICAL GOODS AND APPARATUS

Destination	Sept., 1949	Sept., 1948	Destination	Sept., 1949	Sept., 1948
	£	£		£	£
Channel Islands	22,701	25,224	France	36,618	29,889
Malta and Gozo	13,315	27,405	Switzerland	18,068	26,245
Cyprus	8,747	14,182	Portugal	24,035	189,599
British West Africa	168,586	101,677	Spain	20,572	48,532
Union of South Africa	817,838	907,424	Austria	128,184	9,784
Northern Rhodesia	41,545	26,341	Hungary	8,749	14,804
Southern Rhodesia	113,998	119,418	Czechoslovakia	30,404	12,220
British East Africa	118,958	101,767	Yugoslavia	1,191	7,466
Bahrein, Koweit, Qatar and Trucial Oman	47,179	26,884	Greece	74,231	66,429
India	613,779	417,184	Turkey	63,064	129,468
Pakistan	43,221	78,580	Dutch East Indies	18,758	35,341
Malaya	319,319	145,921	Dutch West India Islands ...	5,174	6,511
Ceylon	81,747	63,207	Portuguese East India	16,639	21,558
Hong Kong	169,035	129,636	Syria	41,472	29,492
Australia	1,014,934	749,575	Lebanon	23,619	32,424
New Zealand	487,626	350,170	Palestine	153,415	6,230
Canada	89,257	66,175	Egypt	149,146	128,442
British West Indies	135,005	90,485	Iraq	94,203	88,399
Anglo-Egyptian Sudan ...	15,142	25,089	Iran	213,680	137,061
Other British Countries ...	124,688	78,241	Burma	28,050	22,803
Irish Republic	175,658	168,633	China	189	15,650
Soviet Union	55,658	64,687	United States of America ...	15,491	9,026
Finland	35,215	43,164	Mexico	8,269	10
Sweden	124,529	207,024	Colombia	4,000	6,158
Norway	143,019	59,923	Venezuela	63,633	50,201
Iceland	28,716	20,428	Chile	36,007	2,089
Denmark	92,147	103,846	Brazil	28,220	20,132
Poland	63,994	8,768	Uruguay	18,387	918
Germany	12,216	27,601	Argentine Republic	240,676	219,269
Netherlands	222,523	161,427	Other Foreign Countries ...	183,149	79,073
Belgium	69,469	112,791	TOTAL	7,217,057	5,968,011

seas market for radio receivers also remains quiet.

Among purchasers of goods and apparatus, Australia leads with a total of £1,014,934 in September against £749,575 a year ago. Fluctuations in the monthly totals make it difficult to assess the progress achieved in some of the smaller markets. In the case of Palestine, for example, the month's figure of £153,415 compares with only £6,230 a year ago, but the aggregate value so far this year is, in fact, lower than in the two preceding years. Although a little better than a year ago, shipments of goods and apparatus to Canada and the United States were less than in August.

Turning to electrical machinery, British manufacturers of the smaller types of generating plant (up to 200 kW) continue to do well. For the month the September amounted to £342,586, compared with £364,493 in August and £290,069 in September, 1948. Canada replaced the United States as the principal supplier of goods and apparatus (excluding machinery) with £73,255, followed by the U.S., £63,625; and the Netherlands, £46,075.

A 75th Anniversary

Earle, Bourne & Co., Ltd., manufacturers of cold-rolled brass, cold-rolled copper and solid-drawn brass and copper tubes, celebrate their 75th anniversary this year, and they have issued a well-produced booklet which, in addition to giving particulars of the company's history, contains a number of useful tables and data. There are also some excellent illustrations of the company's works and representative examples of its products.

Commerce and Industry

Scottish Board Sales Conference
Trade Opportunities in West Africa

THE North of Scotland Hydro-Electric Board held its second annual sales conference at Oban from 4th to 7th October.

Area managers and sales staff from the Board's fourteen areas attended the conference, which was addressed on the opening day by Mr. T. Johnston, chairman of the Board, Sir Edward MacColl, deputy chairman, Sir Hugh Mackenzie and Mr. N. S. Beaton, members of the Board.

The conference was opened by Sir Edward MacColl, who said that the Board must develop the sales side of its business; there was a great wealth of revenue in untouched markets. Some of the major hydro-electric schemes would come into operation at the end of this year or in the early spring of next year. Sloy would have 32,500 kW at the end of the year. The Clunie station of the Tummel - Garry scheme and the Fannich scheme would follow early in 1950.

He counselled area representatives to be on the look-out for ways in which they could improve street lighting in towns and villages, to use imagination and enterprise in extending the use of electricity, and in assisting hotel proprietors to bring their establishments up to date.

Mr. T. Johnston said that every member of the Hydro-Electric Board was determined to lose no opportunity whatever of seeing that the full powers given them by the Act of Parliament were used for the prosperity of the people of the North of Scotland.

Mr. D. R. Griffiths, director of the Incorporated Sales Managers' Association gave a lecture on "Selling and Marketing," and a number of papers were read by members of the Board's staff.

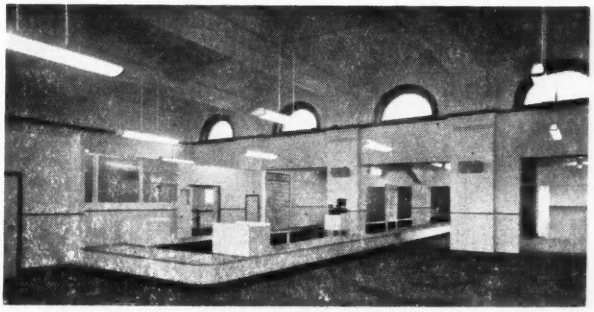
The Central Office of Information film, "Harnessing the Hills," was shown.

B.E.A. Kitchens

Last week we referred to the electric cooking apparatus supplied by the Jackson Electric Stove Co., Ltd., for the kitchens at the headquarters of the British Electricity Authority. The Pressed Steel Co., Ltd., now informs us that it has supplied "Prestcold" refrigeration service cabinets for these kitchens. The cabinets have a capacity of 15 cu. ft and are finished to harmonize with the cream *décor* of the kitchens.

Customs Shed Lighting

When the British Railways Executive decided to renovate the Customs sheds at Parkeston Main and West Quays, Harwich, it was considered that the installation of fluorescent lighting would do much towards brightening the general surroundings, and assisting the officials in the execution of their duties. A scheme was accordingly prepared by the Electrical Department of the British Railways, and Thorn Electrical Industries, Ltd., were given the contract to supply the fittings. In the main halls thirty-nine "Atlas" twin tube decorative fittings are used, together with a quantity of single tube enclosed units. In certain sections where the ceiling level drops considerably, enclosed ceiling units are employed. A total of eighty-eight units have been installed.



"Atlas" fluorescent lighting at Parkeston Customs sheds

Contract Price Adjustment Formulæ

The following are the contract figures for use in the B.E.A.M.A. contract price adjustment formulæ:

The rate of pay for adult male labour

at 8th October is deemed to be 115s (unchanged.) Cost of materials: The Board of Trade index figure for intermediate products at 8th October is 259.8 and is the figure for the month of September (against 257.0 for August).

"Aslib" Meeting

A meeting is being held by "Aslib" at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.2, on 2nd November at 5.30 p.m., when papers will be given by Dr. A. King, Director of the Scientific Secretariat of the Lord President's Office, and Dr. D. C. Martin, assistant secretary of the Royal Society, describing the work in progress as a result of the Royal Society's Scientific Information Conference in 1948.

Transformer for Staythorpe

The accompanying illustration shows the first 75 MVA transformer to be manufactured in the new heavy plant factory at the B.T.H. Rugby Works. This transformer is the first of three similar units ordered from the B.T.H. Company for installation in the B.E.A. generating station at Staythorpe, near Newark. Outside the factory, new railway tracks have been laid to service the despatch bay, and on 29th September a 12-axle "crocodile" truck took away the transformer, which weighed ninety-four tons when stripped for transport.

The first large transformer to be made in the new heavy plant factory at the Rugby works of the British Thomson-Houston Co., Ltd.

The factory has a main bay 500 ft long and 90 ft wide; including the annexes and galleries, which run the entire length of the building, the total floor area is over 125,000 sq ft. Cranes run the length of the main bay, and the two largest of these can each lift 110 tons. They run on rails 50 ft above floor level. Due to the height of the building it is necessary to have high-powered lamps in order to give satisfactory illumination of the working plane. The main bay lighting consists of fourteen units comprising one 2½ kW "Mazda" mercury vapour lamp and two high-powered tungsten lamps, each unit having an output of 8½ kW; other parts of the building are illuminated by "Mazda" fluorescent lamps. Some of the largest manufacturing plant in the Rugby Works is installed in this factory for making the largest transformers, alternators for hydro-electric projects, generators and motors yet envisaged.

E.D.A. and Rural Electrification

We have received from the British Electrical Development Association, 2, Savoy Hill, W.C.2, the first of a series of handbooks on farm electrification. Its subject is "The Small Automatic Hammer Mill" and it comprises 28 well-illustrated pages. After a general introduction on the grinding of stock feed there is a brief and simple description of the small mill with notes on the advantages gained by its use. There follow some notes on installation and methods of operation are given extended treatment. The matter is based on an E.R.A. Technical Report by C. A. Cameron Brown. Single copies are obtainable gratis from the Association. If it is required in quantities the charges are 10s a dozen and £4 a hundred.

Future booklets will cover farm wiring, water pumping, sterilization of recorder milkers, etc.

British West Africa Market

In a report on economic and commercial conditions in British West Africa, prepared by Mr. A. R. Starck, one of the United Kingdom Trade Commissioners for the Commercial Relations & Exports Department of the Board of Trade (H.M. Stationery Office, 1s 3d net), figures are given which indicate the growing market for electrical goods and apparatus, the greater part of which are supplied from the United Kingdom.

In Nigeria, imports rose from £87,793 in 1938 to £386,327 in 1947, and practically the whole of this trade is in the hands of

the United Kingdom. The shortage of generating plant has hampered the sales of electrical appliances, but when new plant now on order is installed the demand for such appliances as cookers, hotplates, water heaters, fans, kettles, irons, etc., and, in Northern Nigeria, electric fires, should increase.

The value of electrical imports into the Gold Coast in 1938 was £124,000, which had risen by 1947 to £214,512, the United Kingdom being the main source of supply. As in Nigeria the sale of appliances is restricted at present by the heavy call on existing generating plant.

In Sierra Leone the value of electrical trade rose from only £4,809 in 1938 to £33,772 in 1947, the United Kingdom's share being over 82 per cent.

The Gambia provides a very restricted market. The electricity supply throughout British West Africa is 230 V, 50 cycles.

Aluminium Conduit

Although aluminium conduit for electrical wiring systems has been used abroad for several years, it is only recently that it has become available in this country at a competitive price. This conduit is now available from the Northern Aluminium Co., Ltd., Banbury, Oxfordshire, and the company has issued an illustrated brochure describing its characteristics and the various methods of installation which necessarily differ from those applicable to steel conduit.

E.A.W.'s 100th Branch

The inaugural meeting of the Ryde, Isle of Wight, Branch of the Electrical Association for Women, which will be held on 24th November, will bring into being the 100th branch of the Association. The president of the new branch will be Lady Baring, with Mrs. Jordan as chairman and Miss Hawkins as secretary.

Zinc Alloy Die-Casting

By means of a series of questions and answers, a sixteen-page booklet issued by the Zinc Alloy Die Casters' Association, illustrates the variety of ways in which zinc alloy die castings can assist modern industry. The booklet shows how the process can be used economically for both short and long runs and for making small as well as large parts. Each illustration shows a particular aspect of zinc alloy die casting. Copies of the publication are available free of charge on application to the Association at Lincoln House, Turl Street, Oxford.

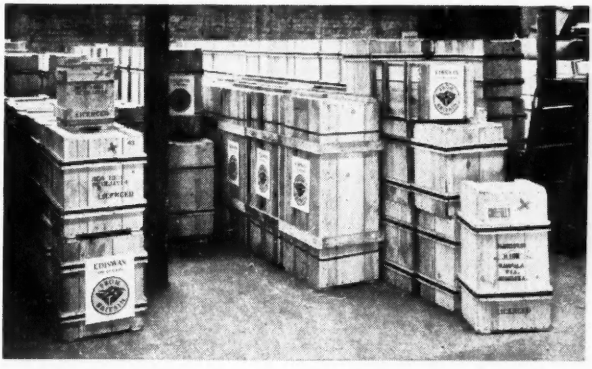
Management Conference

The British Institute of Management, in conjunction with the Institute of Industrial Administration, is holding the 54th Oxford Management Conference at Harrogate from 17th-20th November.

Ediswan Overseas Publicity

The Edison Swan Electric Co., Ltd., has introduced an addition to the "Showing the Flag" label now used by firms supplying the overseas markets. On all consignments of their products for export there now appears a special card bearing the widely adopted design of a Union Jack with the words "From Britain" but also with the name "Ediswan," followed by the name of the products.

The accompanying picture shows consignments of "Ediswan" car batteries and battery chargers leaving the Ponders End Works *en route* to Iceland. This is part of a consignment of 400 "Ediswan" batteries sold to Iceland since June.



Consignment of "Ediswan" batteries and battery chargers for Iceland

Industrial Law Courses

In view of the great demand for tickets for both the October and November short courses on industrial law by Mr. H. Samuels, Barrister-at-Law, the Industrial Welfare Society has arranged a further course to be given by Mr. Samuels on Tuesdays, 10th, 17th, 24th and 31st January, at the

Society's headquarters at 48, Bryanston Square, London, W.1. Applications for tickets (£1 1s for members and £1 10s for non-members), should be made to the Secretary.

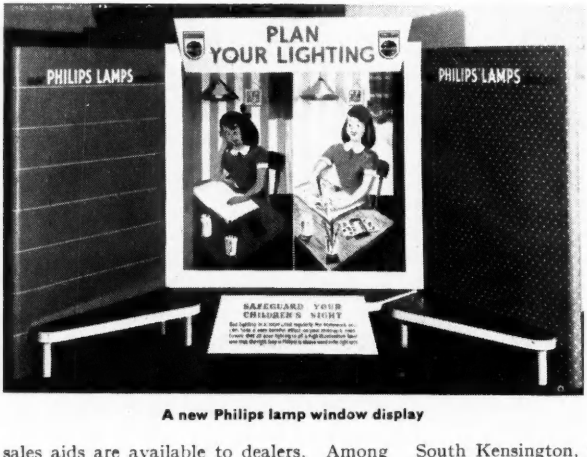
Shop Window Lighting Course

Fifty members of district sales and installation staffs from all parts of the North Western Electricity Board's area attended a special one-day course on shop window lighting in Manchester, on 14th October.

The course was arranged by the Board's Commercial Department in co-operation with the Electric Lamp Manufacturers' Association, and included four lectures, two before and two after mid-day, given by Messrs. W. Robinson and R. L. C. Tate. They dealt with electric lamps, particularly fluorescent lamps and the newest types of shop window floods and spots; current shop window practice in England and abroad; installation data (use of standard filament and fluorescent reflectors, louvred ceilings, laylights and other special problems); and the building of the after-hours shop window load (survey of present day and pre-war practice and a discussion of the advantages of after-hour lighting to shopkeepers).

Lamp Publicity

As in the past few years, Philips Electrical, Ltd., is confining the bulk of this season's lamp publicity campaign to "point of sale" advertising, and many attractive sales aids are available to dealers. Among these is a new arresting showcard, illustrating in cut-out form, an attractive young lady holding a tray of Philips' tungsten lamps. This showcard is 4ft 10in high, and is printed in full and natural colour. The message reads "Delighted to Serve You." A full-colour reproduction of the Philips Underground poster "If Eyes Could Only Speak" is also available to dealers in the popular 20in x 30in size. For big shops, large wooden window displays are available. These are hand-painted displays of attractive appearance and illustrate the benefits to be obtained from planned lighting in the home. For the smaller dealer, in addition to the showcard and poster described, a number of smaller showcards are also available, together with a complete range of literature and technical publications of all Philips lamps and lighting fittings. Distribution of material is through sales representatives.



A new Philips lamp window display

Atomic Physics

The film made by G.-B. Instructional, Ltd., "Atomic Physics," which was reviewed in our issue of 12th December, 1947, has now been included in the programme at the New Gallery Cinema, Regent Street, London, W. This attempt to bring before the lay public the evolution of modern nuclear physics is to be commended, although the general filmgoer may need to see the film several times if he is to absorb all that is put before him.

B.I. Callender's Construction Co.

We have received from this company (21, Bloomsbury Street, London, W.C.1) an organization chart giving the names and positions of the directors and principal officers with particulars of the various departments and contracts offices at home and overseas.

Educational

The City & Guilds of London Institute (Department of Technology) has issued the regulations and syllabuses for examinations in telecommunications and electrical subjects for the 1949-50 session. Copies (1s 3d post free) can be obtained from the Department, 31, Brechin Place, South Kensington, S.W.7.

The Calendar for 1949-50 of the University of London, University College, just issued, is a voluminous publication of 600 pages co-

taining prospectuses of the various faculties and particulars of the organization and personnel.

Change of Frequency and Voltage

In the article bearing this title by Mr. J. L. Watts in last week's issue the phrase on page 752 (just above the diagram) should have read "it may be an advantage to run it (the motor) with its delta windings connected in *star* . . ."

Trade Announcements

Gowshall, Ltd., have removed to Rood End Road, Oldbury, Birmingham (telephone Broadwell 2291/2).

Mr. R. L. Simpson, of "Rydal Mount," London Road, Lichfield, has been appointed representative of **B. & H. (Nottm.), Ltd.,** for sales of "Bermex" switch and fuse gear, and electrical accessories, in the Birmingham area.

Mr. J. Dawson, for many years in the export sales office of Dunlop's, Ltd., has been appointed by **Stokes Appliances, Ltd.,** to represent them in Scotland. Mr. C. A. Lawson will now concentrate more upon the company's sales in the South of England.

Lead Prices Reduced

The Ministry of Supply announced last week that from 19th October the price of good soft pig lead was reduced from £111 to £105 per ton delivered.

P.V.C. Battery Separators

Such successful results have been achieved by the use of "Porvic" microporous separators now used in most of their motor-car batteries and many of their commercial batteries, that Pritchett & Gold and E.P.S. Co., Ltd., have now almost completed the erection of a large new factory solely for their production adjacent to the main Dagenite Works at Dagenham. These new polyvinyl chloride separators were developed originally to meet Service requirements for long-life batteries and the improvements are now being made increasingly available for civilian users.

These and other important developments aiming at further improving the quality of "Dagenite" batteries were shown to a party of electrical and motor trade Press representatives when they made a tour of the works last week. Particularly striking were the stringent tests undertaken and the high standard of workmanship demanded, also the comprehensive precautions which have now eliminated lead poisoning as an occupational disease.

The visitors were welcomed by Mr. E. Honey, factory manager, and Mr. R. H. Cobham, manager of Holsun Batteries, Ltd., who, through their depots and over 300 service agents throughout the British Isles, are responsible for the distribution and servicing of "Dagenite" batteries.

Finished "Dagenite" batteries at the end of the assembly line

E.I.B.A. Year Book

The Year Book for 1949 of the Electrical Industries Benevolent Association, now published, includes the annual report and accounts for 1948. Lists of the names of the members of the Council and of the Court are given and also the names, addresses and telephone numbers of the hon. branch secretaries. There is also an enrolment form for those wishing to become members, with qualifications for different grades of membership.

Catalogues and Lists

The Electric Meter Co., 16, Melville Lane, Torquay, Devon.—Priced catalogue of new and reconditioned house service meters.

Loblite, Ltd., Third Avenue, Team Valley, Gateshead-on-Tyne, 11.—Catalogue (No. 113) of waterproof lighting fittings and accessories.

General Electric Co., Ltd., Magnet House, Kingsway, London, W.C.2.—Priced leaflet (H.O. 858) describing a 3 kW industrial unit heater.

Studying American Practice

SIX WEEKS' TOUR BY BRITISH ELECTRICITY TEAMS

LAST week-end two teams appointed by the British Electricity Authority and Area Boards, at the invitation of the Anglo-American Council on Productivity, sailed in the *Queen Mary* to obtain first-hand information on the best practices employed in the American electricity supply industry.

One team will be concerned with generation and transmission and the other with distribution. Each consists of sixteen members and the personnel have been selected through the medium of the joint advisory machinery representative of the Electricity Boards and the trade unions. The visit will last for six weeks. The sterling costs involved are being borne partly by the British Government and partly by the B.E.A. and the Boards, and all dollar expenses in the United States, including subsistence and travelling, will be met from funds made available by the Economic Co-operation Administration.

The leader of the generation and transmission team will be Mr. W. M. Tulip, secretary, B.E.A. North Eastern Division, and of the distribution team Mr. R. B. Richardson, commercial officer, Hull Sub-Area, Yorkshire Electricity Board. At a Press conference prior to departure Mr. Tulip explained that the teams were a cross-section of the whole industry representing people from all over the country and from all sorts of different jobs. They hoped to exchange views with their friends across the Atlantic and learn many things that would be useful in this country; also, it was possible that they would be able to tell the people in America something too.

Among the subjects to be investigated are the following:—

Generation and transmission: Design and layout of power stations and techniques of operation and maintenance of all categories of plant; progress made in the erection, operation and maintenance of "outdoor" stations with special reference to their capital and running costs; design and erection of transmission lines, both overhead and underground; operation and maintenance procedures, including fault location, etc.; substation equipment and practice.

Generation and Transmission Team (left)
Front row (left to right): Messrs G. Greenwood, J. W. Whelan, J. H. F. Wallace, T. Cochrane, F. H. S. Brown, and W. M. Tulip. Middle row: A. J. Gay, C. L. Jaques, G. F. R. Packham, A. Hunter, H. Tillotson and G. P. Hutchinson. Back row: R. A. Powles, S. E. J. Duxbury, H. C. White and A. Aldridge.

Distribution Team (right)
Front row (left to right): Messrs J. E. Waterman, R. Mallet, R. G. Cook, R. D. V. Roberts, R. B. Richardson and H. R. C. White. Middle row: D. H. J. Cramer, M. C. Wright, W. C. F. Evans, E. Binns and H. S. Petch: Back row: A. Devenport, J. E. Allsobrook, T. H. Hobkirk, A. M. Gorman and C. Holt.

and numbers employed at power stations corresponding to British stations.

Distribution and commercial: Design, erection and maintenance of both overhead and underground lines and cables; substation practice; rural supplies; current practice in wiring of consumers' premises and metering, together with servicing of wiring and appliances; tariff policies with particular reference to load factor improvement, peak loads, etc.; contracting activities of utilities and relations with outside contractors; consumer research; public relations, accountancy, etc.

Labour relations: Joint negotiating machinery and methods of wage payment with particular reference to incentives; methods of joint consultation within the industry; welfare schemes, education and training.

The members of the teams comprise the following:—

Generation and Transmission Team.—Supervisory group: Messrs. W. M. Tulip (leader), S. E. J. Duxbury (section head, accounts, Portsmouth), and C. L. Jaques (station superintendent, Barking). Technical group: Messrs. F. H. S. Brown (generation engineer, construction, Merseyside and N. Wales Division), G. P. Hutchinson (third assistant engineer, South Wales Division) and H. Tillotson (combustion engineer and chemist, Hardingstone Junction generating station, Northampton). Workshop group: Messrs. A. E. Aldridge (leading stoker, Battersea), A. J. Gay (turbine driver, Portishead power station), G. Greenwood (coal and ash crane driver, Ferrybridge power station), A. Hunter (chargehand, coal handling, Willow Holme power station), G. Packham (foreman instrument repairer, Brighton "A" power station), R. A. Powles (chargehand linesman, Ipswich), J. W. Whelan (first-class telephone electrician, Moseley, Birmingham) and H. C. White (turner and fitter,, Portobello power station). Representative of industry's conciliation machinery: Mr. J. H. F. Wallace (general secretary, E.P.E.A.). Secretary: Mr. T. Cochrane (deputy labour relations officer, B.E.A.).

Distribution Team.—Supervisory group: Messrs. R. B. Richardson (leader), E. Binns (manager, Oldham Sub-Area, North Western Board), R. Mallet (chief assistant engineer, Midlands Board), and M. C. Wright (clerk, S.E. Scotland Board, Edinburgh area). Technical group: Messrs. D. H. J. Cramer (senior assistant engineer, development and planning, Northmet Sub-Area, Eastern Board), H. S. Petch (meter tester, London Board) and H. R. C. White (Cornwall Sub-Area engineer, South Western Board). Workshop group: Messrs. J. E. Allsobrook (distribution foreman, Haverfordwest), A. Devenport (overhead linesman, Chester), W. C. F. Evans (electrical fitter, London Board), A. M. Gorman (wireman's mate, S.W. Scotland Board), T. H. Hobkirk (foreman, N.E. Board), C. Holt (electrician, Derby, E. Midlands Board) and J. E. Waterman (installation inspector, Southern Board). Representative of industry's conciliation machinery: Mr. R. G. Cook (national industrial officer, National Union of General and Municipal Workers, and joint secretary, trade union side, National Joint Industrial Council). Secretary: Mr. R. D. V. Roberts (secretary, National Joint Advisory Council).

Transatlantic Trade

Guarantees Against Losses

IN his speech at the BEAMA Catalogue luncheon reported on page 807 the President of the Board of Trade (Mr. Harold Wilson) referred to new facilities which were being offered by the Export Credits Guarantee Dept. to exporters to the United States and Canada. Details of these were announced last week.

The Department will guarantee exporters against loss arising from market research surveys that do not pay for themselves over a period of time. The idea is that exporters will pay by means of future business. The Department will also guarantee exporters against loss involved in extraordinary advertising and promotional expenses in cases where a survey has recommended methods of merchandizing.

United Kingdom exporters will have to carry stocks in the United States and Canada if they are to maintain continuity of supply according to North American standards, and fully exploit advantages gained from promotional expenditure, etc. In this case, too, the Department will carry a share of any loss.

These facilities are not in the nature of subsidies and propositions must be business-like and planned by capable people. The aim is to prevent loss arising from unforeseen circumstances such as a North American "recession," revision of tariffs, etc.

The Department welcomes applications from firms or individuals who wish to take advantage of the facilities. Inquiries should be sent to the headquarters at 9, Clements Lane, London, E.C.4 (Mansion House 8771), or to the Department's branch offices.

PARLIAMENTARY NEWS

By Our Special Reporter

DURING the debate in the House of Lords on the second reading of the National Parks and Access to the Countryside Bill, Lord Harlech called attention to what he termed a threat to Snowdonia by the development of hydro-electric power there. He said that he was all for the development of hydro-electric power, but everything depended on how it was done. Who was to see that when one of the great centralized bureaucracies put up a power house it was sited with some regard both to amenity and to the preservation of the characteristics of a place like Snowdon? If he was rightly informed it was proposed to build three new power-houses on Snowdon itself; one of them at the entrance to the famous Pass of Aberglaslyn. The authorities concerned had been asked to move it 400 yards away, but they refused to budge. And this property was vested in the National Trust!

Lord MacDonald, the Paymaster-General, replying for the Government, agreed that hydro-electric installations were of the greatest concern to the whole of the Snowdon area. The local people recognized that such installations might be necessary, but felt that the buildings when erected might be made to harmonize with local beauty. They hoped that local stone, and if possible, local slates would be used. The Ministry of Town and Country Planning would do all it could to safeguard the beauty of the countryside.

Electric Cooking in the Navy

Major Bruce asked the Parliamentary Secretary to the Admiralty if he would give the names of those ships which had been equipped since 5th November, 1947, with galleys up to United States standard.

Mr. Dugdale said that since 5th November, 1947, 12 ships had been fitted with electric galley ranges, while a further seven were now being similarly equipped.

Supplies to Berkskire Villages

Mr. Hurd asked the Secretary of State for Air if he was aware that no progress was being made with the provision of a main supply of electricity for Lambourn Woodlands and Woodlands St. Mary, in Berkshire, because of the unwillingness of his department to assist the Southern Electricity Board in providing a supply line at reasonable cost to Membury airfield.

Mr. A. Henderson said that this was not due to any unwillingness on the part of his department to assist the Electricity Board. The provision of such a supply was a matter entirely for the Board, and he regretted he had no power to make *ex gratia* payments.

Faults in "Pre-fabs"

Mr. J. Morrison asked the Minister of Health how many local authorities had sought an assurance from his department that they would receive an adjustment of the £8 a year maintenance allowance for prefabricated houses so as to make up for the extra cost caused by faulty workmanship and electrical defects.

Mr. Bevan said that no separate record of these applications was kept. He would, however, refer the hon. member to the financial terms upon which these houses were provided. It would be seen from Appendix IV to the Memorandum on Temporary Accommodation that a local authority would not be entitled to an adjustment merely on the ground that maintenance costs in excess of £8 a house were incurred in any one year.

Cuts in Government Expenditure

Mr. Attlee, the Prime Minister, in announcing "cuts" in Government expenditure, said that the capital expenditure programme must be reduced by about £140 millions a year. In addition to a number of smaller items, both in the industrial and the Government fields, on which some reductions could be made, they must secure a substantial total contribution from the large programmes of capital expenditure of the fuel and power industries, the expanding education programme, new housing, and the large field of miscellaneous investment. While there could be no question of the importance to our economy as a whole of capital expenditure in the fuel and power industries, nevertheless a substantial contribution could be obtained there. So far as possible, the cuts would be made at the expense of longer-term projects.

Steel Utilization

Mr. Erroll asked the Minister of Works what progress had been made by the Professional Institutions' Committee on improved methods of steel utilization.

Mr. Key said that the Committee had reviewed the steps already being taken by the professional institutions to secure adequate discussion of and publicity for improved methods of steel utilization, and had suggested a number of further steps. Some of these were still being discussed and the Committee did not propose to report until the discussions were concluded.

Power Station Design

Nearing the Limits of the Heat Cycle

IN a paper read before the Institute of Fuel on 18th October, Messrs. E. Forth and J. B. Jackson (B.E.A.) reviewed the trend of power station design during the past fifty years and showed that the reduction in the average heat rate to 16,400 B.Th.U. per kWh sent out had resulted in a coal consumption of 25 million tons per annum instead of the 83 million tons which would have been required at the heat rate obtained in 1920. The approach to the limits of the heat cycle, however, indicated that future designs would be determined largely by other matters than thermal efficiency, location in regard to fuel and water supplies and ash disposal being predominant.

Types of Station

The best sites should be occupied by stations containing about 15 per cent of the total capacity which were designed to carry base loads throughout their lives. A second class, containing 65 per cent of the plant and typified at present by those with standardized 60 MW sets and steam conditions of 900 lb/sq in and 850 deg F, would be suitable for continuous operation with variable loading and for shutting down at week-ends.

The third class, with 20 per cent of the kW installed, would be designed at low capital cost for intermittent operation with steam conditions of 600 lb/sq in and 850 deg F or less. This procedure should, the authors suggested, replace the present one in which obsolescence was determined by the date of construction. Typical production costs for a 600 lb/sq in 800 deg F station showed 46 per cent to be due to fuel, including handling, and 47 per cent to capital charges.

The land required for a 240 MW station containing 60 MW generators measured generally about 74 acres, made up as follows: main buildings, 8; coal storage (seven weeks' supply), 6; ash and silt disposal, 20; coal conveyors, approach roads, railway sidings, etc., 40. Cooling towers would require an additional 11 acres. At one coalfield site, 21 million tons of coal (over 30 years supply to the station) were "sterilized" under the foundations. A 30 MW turbine and one boiler on a reinforced concrete raft would probably be the best arrangement for pithead sites. River-water cooling would require 21 million gal/hr against 150,000 gal for cooling towers. Ash sluicing called for a further 100,000 gal and feedwater make-up for 3,000 gal.

Cost items in the typical case (per kWh sent out) were given as: fuel 0.2341d; fuel transport 0.0215d; fuel handling 0.0093d; ash disposal 0.0045d; stores 0.0014d; supervision salaries (excluding head office) 0.0024d; operation wages 0.0105d; maintenance labour 0.0127d; maintenance materials 0.0097d; 8 per cent capital charges on 25-year life at £50 per kW with 40 per cent load factor 0.275d; total 0.5811d.

Capital Costs

Capital cost per kW was allocated as follows: foundations and buildings, £15.27; turbo-generators, auxiliaries and pipe work, £7.34; boilers, auxiliaries and pipe work, £17.35; coal and ash handling plant, £3.36; circulating-water system, £1.43; switchgear, £1.49; other electrical work, £1.60; miscellaneous, £2.16; total, £50.

The percentages of total cost of repairs and maintenance were: buildings, 5.00; turbines, 11.67; generators, 2.55; boilers, 59.80; circulating-water plant, 1.48; other electrical plant, 5.85; mechanical auxiliaries and pipework, 13.65.

Reheating of the steam cycle (which had not been suitable in the past for two-shift operation) was advocated for base-load stations. Operation particulars were given for Port Washington station (United States) in support of this view. There the one-boiler one-turbine principle for two sets had proved remarkably reliable and had given an average annual heat consumption of 10,750 to 10,500 B.Th.U. per kWh sent out.

For conditions in Great Britain, the same principle could be adopted with a simple interconnection between two sets. The economic advantage of very high steam pressures was questioned, but probable reduction in cost of alloy steels

would provide an incentive to the use of higher steam temperatures. Progress in these directions called for corresponding advances in the technique of maintenance (including welding), since first place must be given to reliability.

Sections of the paper were devoted to chemical control of feed-water and circulating water, pipe work simplification, various types of furnaces and firing appliances, superheaters and the price structure of coal.

Supply to Coal Mines

Potential Annual Requirements 7,500 Million kWh

A PAPER presented before the Institution of Mining Engineers on 20th October by Mr. B. L. Metcalf (chief mechanical and electrical engineer, National Coal Board) dealt with "The Power Problems in the Coal Industry." Basing his study on the recommendation of the Reid Report that complete electrification should be adopted in all new mines and seriously considered for existing pits, the author made a comprehensive survey of present conditions from which he concluded that the combustion of even inferior fuels in old plants was economically indefensible, although their retention might be necessary for the time being. Good fuel should be saved for other purposes than electricity generation and some proportion of the capital allocated to cleaning plants could be economically transferred to the development of methods of burning low-grade fuel instead. Only 16 per cent of coal now burned at collieries was unsaleable.

Mr. Metcalf favoured the erection at collieries having large washeries of cooling-tower generating stations closely integrated with colliery working and related to the types of coal mined and cleaned and the market demand for such coal.

The greatest number of kWh should be obtained from low-grade fuel compatible with a plant cost not exceeding that of the power stations which fixed the national level for prices of electricity. The quantity of low-grade fuel available and not the colliery demand for electricity should determine the size of the local generating stations. Account should also be taken of possible proceeds from upgrading inferior fuels for sale in the open market.

The potential annual electrical requirements of all collieries, based on 30 kWh per ton for 250 million tons of coal raised, was 7,500 million kWh, or about one-sixth of the present national total sales, with a maximum demand of 1.82 million kW at 47 per cent load factor. The m.d. occurred about an hour after that on the grid, but thereafter the load curves were similar. Where a colliery bought its power from outside but maintained boilers for steam drives, the total power costs were invariably high.

In 1948 10.92 million tons of coal was burned at collieries and 456.3 million kWh was purchased from Area Electricity Boards. Converting the latter to coal at 1.63 lb/kWh, the total colliery power was equivalent to 11.25 million tons for a saleable coal output of 196.7 million tons or 5.72 per cent, whereas for a completely electrified colliery supplied from a modern power station the coal required for power per ton raised would be $30 \times 1.63 = 48.9$ lb or 2.5 per cent of the total. In such cases each reduction of 0.1d/kWh saved 3d per ton of coal raised at 30 kWh/ton.

For a 50 to 100 MW station, the increase in capital expenditure by adopting steam conditions of 900 lb/sq in and 900 deg F instead of 600 lb/sq in and 850 deg F would be about 4 per cent, whereas the full consumption per kWh would decrease from 1.3 lb/kWh sent out to 1.21 lb. With coal at 50s per ton and a load factor of 40 per cent, the fuel saving would balance an increased cost of £4/kW or 8 per cent.

The paper included statistics relating to classes and calorific values of fuel consumed in colliery boilers, electrical demand and sources of power for mines in each N.C.B. Division, analyses of colliery loads over shifts, notes on various colliery electrical loads and numbers of N.C.B. shell and water-tube boilers.

FINANCIAL SECTION

Company News
Stock Exchange Activities

Reports and Dividends

John I. Thornycroft & Co., Ltd.—The consolidated accounts for the year ended 31st July last show that after providing £110,006 for depreciation, the trading profit, including £180,000 in respect of delayed settlement of contracts completed before 1st August, 1948, amounted to £786,237, as compared with £571,041 for the preceding year, and after providing £453,208 for taxation, there is a net profit of £333,029 (against £256,213). The ordinary distribution for the year is unchanged at 22½ per cent, general reserve receives £200,000, and additional profits tax on dividends requires £15,300. The balance carried forward is £109,794 (against £138,165 brought in).

Scophony-Baird, Ltd.—The full accounts now published show a loss on trading for the year ended 31st March last of £9,761, and after providing for interest charges, directors' remuneration, and writing off £16,119 for research and development, and £2,623 for the costs of capital reduction and new issue which took place during the year, the total loss is £32,182 (against £33,216). Of the debit balance of £248,729 carried forward last year, £248,000 was written off under the capital reduction scheme, so that the debit balance carried forward is £32,911. The chairman states that the directors have under consideration the best method of adjusting the capital of the company to enable it to take full advantage of its opportunities. The company has had every possible assistance from its bankers, but the provision of funds on a more permanent basis is desirable.

The Calcutta Tramways Co., Ltd., reports receipts of £1,467,508 for 1948, as compared with £793,523 for 1947, plus advertising revenue of £14,205. After deducting power and traffic expenses, maintenance and repairs, general expenses, staff bonus and staff fund contribution there is a balance of £388,361 (against a deficit of £33,857), and after adding interest and deducting London expenditure, fees, renewals and replacements, etc., there is a net balance of £268,736 (against a deficit of £124,597). From this is deducted debenture interest, and after adding £10,995 tax adjustment, plus £45,444 brought in and tax relief in respect of loss for 1947, £61,500, there is a sum available of £188,108. Improvement and extensions reserve receives £80,000 and the final ordinary dividend is 3½ per cent, making 6 per cent, tax free, for the year (against nil). The balance carried forward is £66,108.

Crabtree Electrical Industries, Ltd., report a consolidated trading profit, together with other receipts, for the year ended 31st July last of £349,346, as compared with £283,826 for 1947-48, and a net profit of £122,310 (against £136,875), after providing for taxation, depreciation, directors' emoluments, patents, auditors' fees, etc. It is proposed to pay a final ordinary dividend of 12½ per cent, making 17½ per cent for the year (same).

Morphy Richards, Ltd., report a trading profit for the year to 30th June last of £90,266, including £1,869 dividend from subsidiary company, as compared with £80,459 for the preceding year. The final dividend is 100 per cent, making 160 per cent for the year (unchanged).

Thos. W. Ward, Ltd., report a net profit for the year ended 30th June last of £474,287, as compared with £477,233 for the previous year. It is proposed to pay a final ordinary dividend of 10 per cent, maintaining the distribution for the year at 15 per cent, less tax.

J. & F. Stone Lighting & Radio, Ltd., reports a group trading profit, subject to final audit, of £380,065 for the year ended 30th June last, as compared with £332,035 for the preceding year, and a net profit, before taxation, of £305,972 (against £274,861). Tax requires £175,985, and it is proposed to pay a final ordinary dividend of 30 per cent, again making 40 per cent for the year. The balance carried forward is £54,116 (against £42,088 brought in).

The British Electric Traction Co., Ltd., has declared an interim dividend on the deferred ordinary of 15 per cent (unchanged).

The Ever Ready Co. (Gt. Britain), Ltd., is again paying an interim dividend of 15 per cent.

The Revo Electric Co., Ltd., is paying an unchanged interim dividend of 5 per cent.

The Automatic Telephone & Electric Co., Ltd., announces that acceptance of the offer of 315,621 ordinary shares at 50s per share totalled 90 per cent. Applications for surplus shares greatly exceeded the shares available. Allotments have been made in

full for applications up to thirty-four shares, and in the case of larger amounts, the maximum allotment is 250 shares.

Oriental Telephone & Electric Co., Ltd., —The accounts of this company were reviewed in our issue of 14th October. In his statement which has been issued with the report and accounts, Sir A. Henry McMahon (chairman) says that good progress is being made with various works in hand to provide for the expansion of the company's system in Singapore and Johore. The extension of the Central Exchange building has been completed and delivery of the equipment to provide 5,000 subscribers' lines has now commenced. Installation is expected to be completed towards the end of next year. Meanwhile work is in progress which will restore the present exchange to its full capacity.

G. N. Haden & Sons, Ltd.—The lists were to open and close yesterday (Thursday) for an issue of 250,000 5½ per cent £1 cumulative preference shares at 20s 6d each.

In the prospectus published on Monday last it was stated that the proceeds of the issue amounting to £239,542 net would be used to reduce bank overdrafts, which totalled £716,425 at the end of last month.

T. Clarke & Co., Ltd., have declared an interim ordinary dividend of 5 per cent tax free.

New Companies

T/V Manufacturing, Ltd.—Registered 22nd September. Capital £100. Manufacturers of and wholesale or retail dealers in wireless and television transmitting and receiving sets, etc. Subscribers: B. J. Edwards and N. A. Twemlow. Regd. office: Radio Works, Cambridge.

Express Powerlite Installations, Ltd.—Registered 26th September. Capital £2,000. Electrical and mechanical engineers for all types of installation work, etc. Directors: W. T. O. Banks and A. C. Wass. Secy.: W. T. O. Banks. Regd. office: 18, Firs Parade, Muswell Hill, N.10.

H.M.K. Electric & Radio Engineering Co., Ltd.—Registered 29th September. Capital £1,000. To acquire the business carried on by H.M.K. Electrical & Radio at 46, Church Street, Shildon, Co. Durham. Directors: M. Kirby and F. W. Muggeridge. Solicitors: Booth & Dixon, Bishop Auckland.

Sparton Radio & Electrical, Ltd.—Registered 12th October. Capital £100. Directors: S. Featherman and A. Landau. Regd. office: 248/250, Bishopsgate, E.C.2.

John Whyld & Co., Ltd.—Registered 12th October. Capital £3,000. Electrical engineers and general electrical installation contractors, wireless engineers, etc. Directors: W. J. Whyld and F. Whyld. Regd. office: Clumber Buildings, Clumber Street, Nottingham.

Clark & Bridle, Ltd.—Registered 11th October. Capital £2,000. Electrical and mechanical engineers for all types of installation work etc. Directors: C. W. Clark and K. F. Bridle. Regd. office: Broadmead House, 21, Panton Street, S.W.1.

A. J. Evans (Electrical), Ltd.—Registered 13th October. Capital £500. Electrical engineers and general electrical installation contractors, etc. Directors: A. J. Evans and A. Evans. Regd. office: 1, Southey Street, Roath, Cardiff.

Albert E. Youle & Co., Ltd.—Registered 13th October. Capital £3,000. To acquire the business of an electrical engineer carried on by A. E. Youle at Sheffield. Directors: A. E. Youle (managing director) and Mrs. Muriel Youle. Regd. office: 920, Ecclesall Road, Sheffield.

Liquidations

Parker Radio Corporation, Ltd.—Winding up voluntarily. Liquidator, Mr. G. G. P. Goldney, 7, Laurence Pountney Hill, London, E.C.4.

B. & W. Plastics (Surrey), Ltd.—Winding up voluntarily. Liquidator, Mr. A. G. White, 73, Cheapside, London, E.C.2.

Bankruptcies

S. Budge, 153, Cleethorpes Road, Grimsby, radio and electrical dealer.—Public examination 1st December at the Town Hall, Great Grimsby.

R. H. Tuck, 7, Grand Parade, Upper Richmond Road, London, S.W.14, electrical engineer, lately carrying on business with another as London Electrical Contractors, at 109, Great Russell Street, W.C.1, and at 9, Newman Street, London, W.1.—Application for discharge to be heard on 1st November at Bankruptcy Buildings, Carey Street, London, W.C.2. Trustee, Mr. W. F. Cresswell, Senior Official Receiver, released 14th October, 1949.

R. S. Warrell, trading as R. S. Warrell & Son, electrician, 2, Norfolk Road, Littlehampton.—Last day for receiving proofs for dividend 4th November. Trustee, Mr. A. E. Orbell, 6 &7, Old Steine, Brighton, 1.

W. J. Griffin, carrying on business at 2, Hinckley Road, Earl Shilton, Leics.—First and final dividend of 7s 6d in the £ payable 14th November at 20 Friar Lane, Leicester.

E. D. S. Munday, 272, Lake Road, Portsmouth, electrical engineer.—Supplemental dividend of 8½d in the £, payable 2nd November at the Official Receiver's office, 10, Rockstone Place, Southampton.

FINANCIAL SECTION
STOCKS and SHARES

STOCK Exchange markets may now be said to have settled down after the protracted suspense caused by the expectation of the statement that was made by the Prime Minister on Monday of this week. Business had been held back, and a good deal of nervousness had been engendered, by the prospect held out by irresponsible and, in some cases, absurd rumours as to what Mr. Attlee would propose in order to combat the present crisis. The half-measures which he actually adumbrated contained none of the causes for apprehension which had worried investors in advance. There was no addition to E.P.T., no capital levy, no fresh stamp duties, etc., and, relieved from these fears, prices in the Stock Exchange rose sharply for about an hour or so. After that, they fell back in most cases, under the weight of a good deal of selling which took advantage of the improvements. Disappointment was expressed at what was deemed to be the inadequacy of the steps taken by the Government to reduce expenditure and to encourage industry. The gilt-edged market gave way, British Electricity 3 per cents to 93 and Transport Threes to 89. Industrial shares followed on similar lines.

Changes on the Week

Most of the price movements during the past week have been downward. Declines in Tube Investments 5l7/6, Telegraph Construction 38s 3d, Revo 47s 6d, Lancashire Dynamo 91s 3d, De La Rue 20s, Electric Construction 48s 3d, give some idea of the general trend of prices. Scottish Cables stand out with a rise to 22s; Switchgear & Cowans at 13s are also 1s up. Cable & Wireless ordinary recovered the fall of last week. Improvements are exceptional, the majority of changes having reflected the nervousness that awaited Mr. Attlee's statement last Monday.

Company News

Morphy-Richards, the electrical appliance manufacturers, report the maintenance of the dividend at a total of 160 per cent, and an increase of practically £10,000 in the past year's trading profit at £90,300. The figures made a good impression on the market, and produced 1s rise in the price of the 1s ordinary shares to 14s. The Scophony-Baird chairman's review mentions the need for fresh capital in a form more permanent than that of bank loans. Meanwhile, he reports outstanding success for the company's television sets at Radiolympia, and discusses the commercial possibilities of the estimate that 80 per cent of the population will come within television range during the next five years.

Crabtree Electrical Industries

Profits reported by this company, for the year ended last July, go against the results of a nine months' period in 1947-48. Since, however, the latter included a full twelve months' trading by the principal subsidiary, J. A. Crabtree & Co., there is little to detract from the favourable comparison of the latest consolidated trading profit of £349,300 with the previous figure of £283,800. On that occasion, the 17½ per cent dividend was covered by group earnings of 38 per cent, and it appears from the latest figures that the same distribution is still covered this time nearly twice over. At last January's meeting, the chairman referred to increasing production from the new Wolverhampton works, and also in South Africa. The price of the £1 shares is now 34s, showing a yield of £5 3s on the money.

Excess Shares

This month's successful capital issue by Automatic Telephone & Electric draws attention to the contention of many brokers that inexperienced shareholders are apt to overlook, on these occasions, the invitation to apply for shares in excess of the definite number allotted to them by way of "rights." In the case of Automatic Telephones, as much as 90 per cent of the new shares were accepted as "rights," but even the small additional allotments, to applicants for the 10 per cent of the new shares not taken up, were well worth having, at about half a crown below the market price. Wherever an allotment letter is accompanied by application forms for excess shares, it is generally worth while for the recipient to make inquiries.

The Investor's Choice

Nowadays, a return of 4¼-4½ per cent is not regarded as an extravagant requirement, and, with this end in view, money is still flowing into the best class industrials. The ordinary shares of such companies as B.I. Callender's, Henley's, General Electric, English Electric and others of similar calibre, have their following in good times and in bad. Associated Electrical Industries ordinary pay little more than 4⅛ per cent, even under present conditions. Among higher yields from sound shares, the £4 18s per cent offered by Crompton Parkinsons at 23s, and 5¼ per cent from Walsall Conduits at 53s 9d, deserve notice.

Solving New Zealand Shortage

GOOD PROGRESS ON LARGE HYDRO-ELECTRIC SCHEMES

IMPROVED hydraulic conditions and the commissioning of additional plant made the electricity supply situation in New Zealand during 1948-49 better than in recent years and it was possible to relax the restrictions. A more definite solution of the industry's difficulties, however, depends on the date of operation of the Maraetai, Roxburgh and Cobb hydro-electric projects. Referring to this in his annual statement, the Minister in Charge of the State Hydro-Electric Department (the Hon. R. Semple) says that efforts are being made to augment the number of skilled workers. With regard to materials, the steel position (except Australian steel) shows general improvement. A temporary shortage of cement is causing some trouble at present. Consideration is being given to the letting of overseas construction contracts, but this problem is complicated by existing international conditions. As from 1st April, 1948, the Ministry of Works became responsible for civil engineering works associated with hydro-electric development.

Geo-Thermal Steam Investigations

In the North Island the second 16 MW unit at Kaitawa was commissioned during the year; at Maraetai it is anticipated that the first unit will be ready by the end of 1951; and at Whakamaru investigation work has progressed far enough to permit the preliminary designs to be put in hand. The sources of hydro-electric energy are more limited than in the South Island, and the possibility of development of power from geo-thermal steam is receiving attention. A small advisory committee of the Council of Scientific and Industrial Research has been set up for this purpose. The Minister observes that the problem is not an easy one, but "the answer must be found."

Developments in the South Island include the commissioning last March of the fifth 15 MW unit at Waitaki, and it is anticipated that a 25 MW unit at Tekapo will be in operation by the end of 1950. At Waipori the Dunedin City Council has decided to construct two new stations aggregating 11 MW, the output of which will be pooled with the Government's system until Roxburgh is ready.

The Roxburgh scheme is designed for a final capacity of 320 MW, with an initial installation of 160 MW. It is estimated that the plant could, in the ordinary way, be ready for operation by 1955; the question of improving upon this date is being examined. An extension at Cobb almost twice the size of the present plant is scheduled for operation in 1952. Endeavours have been made to expedite the delivery of this plant, and the supply of steel for the new penstock has been promised from Britain. It is likely that another new generating station will be needed by 1956, and investigations are being carried out in the Lake Rotoroa district.

Transmission Line Construction

A number of important transmission schemes are also in hand, including 220 kV lines in both the North and South Islands. With the falling off in steel supplies from Australia the New Zealand Government took steps to secure supplies for the fabrication of towers, and steel for the more urgent works is now assured. In addition, a contract for the supply of fabricated towers has been placed in Britain.

Details of the operation of the State systems during the past year are given in the annual report of the general manager, Mr. A. E. Davenport, B.E., M.I.E.E. In the North Island 1,936 million kWh was generated (compared with 1,778 million in 1947-48), including 1,758 million kWh (1,622 million) by Government-owned plants. In the South Island the total generation for the combined system was 819 million kWh (against 742 million).

A separate report by Mr. Davenport as chairman of the Rural Electrical Reticulation Council records that in the two years since applications for subsidies were first considered the Council has approved payments on 1,050 route miles of line. The estimated capital cost of construction of these lines is £528,111, and the total annual subsidies are given provisionally as £27,009.

I.E.E. North Midland Centre

THE first post-war annual dinner of the North Midland Centre of the Institution of Electrical Engineers will be held at the Queen's Hotel, Leeds, on 25th November, when the guest of honour will be Lord Citrine. Applications for tickets (20s each for members and associate members, and 15s each for students and graduates) must reach Mr. W. H. Dunkley, hon. secretary, British Electricity House, St. Mary's Road, Leeds 7, by 11th November.

Electricity Supply

Further B.E.A. Projects : Policy of Avoiding Beauty Spots

APPLICATION has been made to the Minister of Fuel and Power by the British Electricity Authority for consent to the extension of the Brighton "B" station by the installation of a 52.5 MW turbo-alternator and two 320,000 lb/hr boilers. Another application relates to the construction of a new station on a site of 226 acres at Tilbury, designed for an ultimate capacity of 360 MW; the initial installation will comprise three 60 MW sets and three 540,000 lb/hr boilers. A third scheme is the construction of a new station, with an ultimate capacity of 180 MW, on a 101-acre site at Goldington, Bedford. The installation will consist initially of two 30 MW sets and two 300,000 lb/hr boilers.

Hill Wootton Assurance

It may be recalled that last February, following protests against erecting a power station at Hill Wootton, in Warwickshire, the application for consent to the use of the site under the Town and Country Planning Act, 1947, was withdrawn. Mr. W. S. Burge, controller, East Midlands Division, wrote to the Clerk of the Warwickshire County Council stating that everything possible would be done to avoid the necessity of constructing a station in the neighbourhood of Hill Wootton. The County Council has now received a definite assurance that the Authority has no present intention of seeking powers to build the station, nor is the use of this site included in projected programmes. Hill Wootton is a beauty spot in the Shakespeare country.

Mr. H. F. Carpenter, secretary, B.E.A., says in a letter to the County Council that the Authority is sensitive to the need for the preservation of places of natural beauty and desires to find sites for generating stations in other localities wherever practicable.

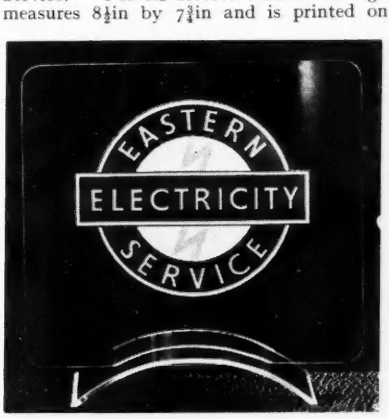
North Acton Scheme Approved

Acton Planning Committee has reported to the Council that, after considering the proposals of the British Electricity Authority to replace the Willesden (Acton Lane) generating station by a new station near Wesley Playing Fields, and objections made by the Council and others, the Minister of Fuel and Power has now given consent for the first stage of the development. This is subject, *inter alia*, to the Authority using the most efficient methods for the elimination of smoke and grit and to the installation (if required at any time by the Minister) of plant for the prevention of the discharge of sulphur into the atmosphere.

In giving his consent, the Minister has recorded assurances given by the Authority since the public inquiry that the cooling towers will be liberally rated and that all towers will be coupled to a common intake culvert so that the heat burden on the towers will be shared whatever the load on the station; that the total output of the station will not at any time, without the Minister's consent, exceed 180 MW; and that the whole of the existing plant will be taken out of commission by the end of 1958 or such later date as may be approved by the Minister.

Eastern Area Notes

The Eastern Electricity Board has now devised a name sign, "Eastern Electricity Service." For its service centres the sign measures 8½in by 7¾in and is printed on



The Eastern Electricity Board's sign

clear "Perspex" in three colours—green, gold and red. The sign is also being reproduced in a suitable size on all the Board's publicity material.

The first major substation for the Norfolk Sub-Area is now under construction on part of the site of the South Denes generating station, Great Yarmouth. This sub-

station is in connection with the 33 kV development in the Great Yarmouth and Lowestoft District and comprises 33 kV and 11 kV switch-houses, relay and control rooms and four 15 MVA transformers and associated equipment.

Arrangements are being made by the Eastern Electricity Board (Essex Sub-Area) for a 33 kV reinforcement of the network between Rayleigh and South Benfleet necessitated by the growth of load.

A supply of electricity has been given to Upwood, one of the largest villages in the Huntingdon District (Fens Sub-Area). The switching on ceremony was followed by an exhibition of electrical appliances.

The first all-electric seed dryer in Norfolk with a load of 50 kW has been installed by a firm of seed merchants in Loddon.

The Northmet Sub-Area has carried out a lighting installation at Queen Elizabeth's Hunting Tower in the Epping Forest.

Water for Drakelow Station

The B.E.A. has applied to the Minister of Health for a licence to construct works and abstract underground water at the site of the proposed Drakelow generating station to a maximum quantity of 320,000 gallons per day.

B.E.A. London Division Headquarters

Plans have been submitted to the Southwark Borough Council by W. Curtis Green, Son & Lloyd for the erection of headquarters for the London Division of the British Electricity Authority on a site bounded by Sumner Street, Canvey Street and Zoar Street, Southwark.

Tenants to Choose

West Hartlepool Town Council has rescinded a resolution that half of the new houses built by the Corporation should be supplied with electricity and half with gas. It has been decided to install both services and allow tenants to choose which they prefer.

Consent to Overhead Line

Discussions have taken place between Settle Rural District Council and representatives of the North Western Electricity Board on the Board's proposal to erect an overhead line via Padiham and Clitheroe. The viewpoint of the Council was that, especially in a locality included in one of the proposed National Parks, an effort should be made to place such lines underground. At last week's Council meeting it was reported that the Board's representatives had stated that the Board was prepared to do everything in its power to prevent the overhead line affecting the natural beauty of the district. The Board also stated that, when the time came for the renewal of overhead lines in villages, an effort would be made to place them underground. Having regard to all the circumstances, the Council decided not to raise any objection to the proposed line.

Midlands Local Committees

The Midlands Electricity Consultative Council announces the formation of local committees for South Staffs and North Worcestershire and Birmingham and District.

Transport Scheme Opposed

By 36 votes to 20 the Newcastle-on-Tyne City Council has approved a report by a special committee rejecting the British Transport Commission's plans to take over the city's trolley and motor bus undertaking as part of the scheme for co-ordinating north-east road passenger transport. The report suggested that the objects of the Transport Commission were already being carried out by the City Council and there was no demand for State control. The City Council is also opposed to the State taking the transport system without paying "adequate compensation."

Radio-active Isotopes

A COURSE of six lectures on the application of radio-active isotopes as tracers in engineering problems is to be held at the Manchester College of Technology on Friday evenings from 7 to 9 p.m., commencing on 4th November. The first lecture will deal with isotopes and their physical and chemical properties, preparation of isotopes, practical techniques in their use as tracers and a survey of the fields of application. Methods of detecting radio-active tracers such as the ionization gauge, Geiger-Müller and proportional counters form the subject of the second lecture, and the next three will deal with applications in more detail. The final lecture will deal with the establishment of a radiochemical laboratory. Intending students should apply to the Principal, College of Technology, Sackville Street, Manchester, 1. The fee for the course is one guinea.

Engineers' Guild

A MEETING of professional engineers, open to chartered members of the three senior Institutions, is being held in Manchester to-day (Friday) to discuss the objects of the Engineers' Guild and to inaugurate a North-Western Branch. The chair is being taken by Brigadier C. [illegible] Parkman and the speaker is Mr. [illegible] Chalmers, both civil engineers.

NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (2s each) may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.

1938

14606. Elin Akt.-Ges. für Elektrische Industrie.—Automatic electric regulating devices. 14th May, 1937. (630124.)

1944

16107. Stevens, A. H. (Submarine Signalling Co.).—Apparatus for submarine signalling. 24th May, 1944. (Convention date not granted.) (630004.)

12764. Sperry Gyroscope Co., Inc.—High-frequency electron-discharge tube structures. 21st July, 1942. (630005.)

1945

16457. Sperry Gyroscope Co., Inc.—Ultra-high-frequency electron-discharge tubes of the velocity-modulation type. 28th June, 1944. (630069.)

17134. British Thomson-Houston Co., Ltd.—Electric phase convertors. 12th July, 1944. (630007.)

1946

14911. Johnson, L. R. J., Holloway, D. G., and White, E. L. C.—Thermionic valve amplifiers. 17th May, 1946. (630132.)

18009. Standard Telephones & Cables, Ltd.—Centre fed antenna. 24th May, 1945. (630010.)

15498. Emery, J. N.—Position indicating instruments. 22nd May, 1946. (630011.)

17089. General Electric Co., Ltd., Espley, D. C., and Edwards, G. W.—Radio signalling systems. 5th June, 1946. (630200.)

19309. Soc. Française Radio Electrique.—Apparatus for synchronizing two frequencies. 27th June, 1945. (630201.)

20393. Soc. Française Radio Electrique. — Radio beacons. 30th June, 1942. (630250.)

20508. Metropolitan-Vickers Electrical Co., Ltd., and Scoles, G. J.—Thermionic valve control circuits. 9th July, 1946. (630075.)

24518. Sylvania Electric Products, Inc.—Electron-discharge device. 22nd August, 1945. (630136.)

25495. O'Brien, W. J.—Radio navigation systems. 27th August, 1945. (630080.)

27284. Sperry Gyroscope Co., Inc. — Ultra-high-frequency electron-discharge devices. 17th October, 1942. (Divided out of 619667.) (630082.)

29942. Tucker, D. G.—Methods of selecting rectifiers for balanced modulators of ring type. 8th October, 1946. (630083.)

31080. Philips Lamps, Ltd.—Electric condensers. 17th February, 1943. (630259.)

32857. Metropolitan-Vickers Electrical Co., Ltd., and Mason, G. R.—Electric lamp holders and fittings. 5th November, 1946. (630143.)

33078. Oliver, C. R.—Induction coils for electro-therapeutical and other purposes. 7th November, 1946. (630208.)

35401. Tucker, D. G.—Electric modulators. 29th November, 1946. (Cognate applications 37371/46 and 38074/46.) (630088.)

35463. Standard Telephones & Cables, Ltd.—Tuning system for coaxial line circuits. 7th May, 1945. (630212.)

35509. Marconi's Wireless Telegraph Co., Ltd.—Electrolytic recording. 3rd December, 1945. (630146.)

36350. Metropolitan-Vickers Electrical Co., Ltd., and Stuart-Williams, R. — Radio and radar receivers provided with automatic sweep arrangements. 9th December, 1946. (630263.)

37196. Pye, Ltd., Edwards, B. J., Lawson, D. I., Cope, J. E., and Germany, L. W.—Television system. 17th December, 1946. (630214.)

37843. Standard Telephones & Cables, Ltd., Scott, T. R., and Weston, W. K.—Cable sheaths and their manufacture. 24th December, 1946. (630147.)

38013. Eureka Williams Corporation. — Suction cleaners, and resilient sleeves therefor. 26th January, 1946. (630148.)

1947

267. Metropolitan-Vickers Electrical Co., Ltd., Scoles, G. J., and Miller, C. W. — Control apparatus for cathode-ray tubes. 3rd January, 1947. (630215.)

646. Standard Telephones & Cables, Ltd., Hellier, W. H. M., McWhirter, E. M. S., and Ward, H. J.—Mounting arrangements for assemblies of electrical apparatus units similar in form but dissimilar in content, such as telephone type apparatus units. 8th January, 1947. (630025.)

2677. Berry, R., and Painton, C. A.—Electric convector heaters. 28th January, 1947. (630154.)

2776. Abram, G. H.—Electric time switches or clock-controlled mechanical devices. 29th January, 1947. (630274.)

4086. M.K. Electric, Ltd., and Arnold, C. L.—Electrical plug connectors. 12th February, 1947. (630276.)

4853. Metropolitan-Vickers Electrical Co., Ltd., and Scoles, G. J.—Thermionic valve oscillators. 19th February, 1947. (630219.)

5835. Standard Telephones & Cables, Ltd.—Method of making and assembling a stem for vacuum tubes. 12th May, 1945. (630028.)

6407. Bader, K. E.—Temperature-controlled electric ladles. 7th March, 1947. (630029.)

7046. Magnetic Analysis Corporation.—Electronic point inspection. 21st May, 1946. (630220.)

9008. Westinghouse Electric International Co.—Electroplating. 10th August, 1945. (630165.)

9083. British Thomson-Houston Co., Ltd., and Blood, W. R.—Thermal responsive glow-discharge electric switches. 3rd April, 1947. (630287.)

9574. Kahn, R. L.—Frequency multiplying apparatus. 26th October, 1945. (630289.)

11871. Western Electric Co., Inc.—Signalling systems. 16th September, 1944. (Cognate application 11872/47.) (630094.)

11873. Western Electric Co., Inc.—Signalling systems. 10th May, 1945. (Addition to 630094.) (630292.)

11874. Western Electric Co., Inc.—Signalling systems. 9th July, 1945. (Addition to 630094.) (630098.)

12909. Crompton Parkinson, Ltd.—Rail vehicles and chassis therefore. 13th May, 1946. (630294.)

13241. Pierce Foundation, J. B.—Electrical conductor-carrying assemblies. 26th October, 1946. (630097.)

14192. English Electric Co., Ltd., and Roberts, W. R. J. B.—Apparatus for testing ignition systems for internal-combustion engines. 28th May, 1947. (630170.)

14335. Smith & Sons (England), Ltd., S., and Moss, E. B.—Means for controlling the direction of rotation of a self-starting single-phase synchronous electric motor. 29th May, 1947. (630171.)

14889. Babcock & Wilcox Co.—Method of joining metals and articles produced by this method. 29th August, 1946. (630037.)

15024. Western Electric Co., Inc.—Signalling systems. 9th July, 1945. (Addition to 630094.) (630098.)

16561. Telephone Manufacturing Co., Ltd., Terry, R. St. G., and Whale, T. H.—Electrical tumbler switches. 23rd June, 1947. (630228.)

16598. Wilkinson, G. H., Divall, R. W., and Metcalfe, C.—Electrically heated irons. 31st July, 1946. (Divided out of 630077.) (Cognate application 33662/46.) (630100.)

16690. Goldstaub, H. H.—Electrical heating devices. 24th June, 1947. (630173.)

18057. British Thomson-Houston Co., Ltd.—Power cables for high-frequency oscillators. 18th September, 1942. (630229.)

18165. British Insulated Callender's Cables, Ltd., and Waddicor, H.—Measurement of the temperature of electric cables. 9th July, 1947. (630230.)

21088. Sylvania Electric Products, Inc.—Sockets for double-ended electric lamps. 9th March, 1943. (630045.)

22944. Dorman & Smith, Ltd., and Lund, J.—Electric fuse boards and fuse handles therefor. 19th August, 1947. (630234.)

23087. Philco Corporation.—Frequency and phase modulators. 25th September, 1946. (630050.)

23656. Forges et Ateliers de Constructions Electriques de Jeumont.—Equipment with camshaft-operated contactors for the control of electric motors. 29th September, 1942. (630051.)

24406. Standard Telephones & Cables, Ltd.—Method of sealing metal bodies to vitreous members. 23rd April, 1945. (630235.)

28024. Sperry Gyroscope Co., Inc.—Ultra-high-frequency electron-discharge tubes of the velocity-modulation type. 28th June, 1944. (Divided out of 630069.) (630110.)

30774. Electric Panels, Ltd., and Keefe, E. J.—Electric heating of hinged hollow doors. 20th November, 1947. (Cognate application 5838/48.) (630059.)

31209. General Electric Co., Ltd., and Caldwell, J. T.—Thrust transfer arrangements. 25th November, 1947. (630113.)

31210. General Electric Co., Ltd., and Caldwell, J. T.—Mechanisms used, for example, for raising tables or like carriers. 25th November, 1947. (630114.)

31348. Philips Electrical, Ltd.—Method of joining glass parts by fusion. 10th September, 1946. (630241.)

31760. Ellor, H.—Current collectors or shoes for trolley-pole heads of electrically driven vehicles. 2nd December, 1947. (630060.)

1949

10214. Metropolitan-Vickers Electrical Co., Ltd., and Scoles, G. J.—Thermionic valve control circuits. 9th July, 1946. (Divided out of 630075.) (630123.)

Next Week's Events

Monday, 31st October

CROYDON.—Café Royal, North End, 8 p.m. A.S.E.E. South London Branch. "A.C. Motor Control, including reference to Electronic Control," by S. H. Harding.

DORCHESTER.—King's Arms Hotel, 7.30 p.m. A.S.E.E. Bournemouth Branch. "Farm Electrification," by P. W. Dod.

LONDON.—Savoy Place, London, W.C.2, 5.30 p.m. I.E.E. Radio Section. Lecture on "The C.B.S. Colour Television System in the United States" by Dr. P. C. Goldmark.

STONE.—Crown Hotel, 7 p.m. I.E.E. North Staffordshire Sub-Centre. "Tidal Power and the Severn Barrage" by H. Headland.

Tuesday, 1st November

CAMBRIDGE.—Cavendish Laboratory, 8.15 p.m. I.E.E. Cambridge Radio Group. "Some Recent Advances in the Design of High-Energy Electron Accelerators" by D. W. Fry.

ELTHAM.—Castle Hotel, High Street, 8 p.m. A.S.E.E. South East London Branch. "M.I.C.C. Cables and their Application," by G. E. D. Redman.

HAMMERSMITH.—Town Hall, 7.30 p.m. A.S.E.E. West London Branch. "Special Protective Means for Portable Electrical Appliances," by F. E. Butcher.

LONDON.—Savoy Place, London, W.C.2, 5.30 p.m. I.E.E. Measurements Section. "Recent Developments in Comparative Methods of Testing A.C. Electricity Meters" by S. F. Musson and R. E. Mell.

Grosvenor House, Park Lane, W.1, 6 p.m. Electrical Contractors' Association, London Branch. Annual dinner and ball.

Caxton Hall, S.W.1, 7.15 p.m. E.P.E.A. London Technical Group. "District Heating," by H. S. Horsman.

MANCHESTER.—Engineers' Club, Albert Square, 6.15 p.m. I.E.E. North-Western Centre. "Selection of Transformers for Use in Distribution Networks, with special reference to the New Low-Voltage Standard of 240 Volts" by E. Tobin.

RUGBY.—Electricity Showrooms, High Street, 6.30 p.m. I.E.E. Rugby Sub-Centre. "The Practical Design of Iron-Cored Components" by A. C. Sim. (Joint meeting with the Rugby Students' Section.)

WORCESTER.—Recreation Club Rooms, Hylton Road, 7 p.m. E.P.E.A. Midland Technical Group. Two sound films: "Planned Electrification," and "A Glimpse of Metro-Vick."

YORK.—Royal Station Hotel, 7 p.m. I.E.E. North Midland Centre. "Tidal Power and the Severn Barrage" by H. Headland.

Wednesday, 2nd November

LONDON.—I.E.E. London Students' Section, 2 p.m. Visit to Creed & Co., Ltd., Croydon.

At the Royal Society of Arts, W.C.2, 6.45 p.m. Institution of Works Managers. "Industrial Psychology," by Mrs. W. Raphael.

MIDDLESBROUGH.—Cleveland Scientific and Technical Institute, 6.30 p.m. I.E.E. Tees-Side Sub-Centre. "The Performance of the British Grid System in Thunderstorms" by Dr. J. S. Forrest.

PALMERS GREEN.—St. John's Hall, Hoppers Road, 8.15 p.m. A.S.E.E. North London Branch. "Insulating Varnishes and Their Uses," by J. S. Hann.

SOUTHAMPTON.—University College, 6.30 p.m. I.E.E. Southern Centre. "Parasitic Forces Existing in Induction Watthour Meters" by G. F. Shotter.

Thursday, 3rd November

CARDIFF.—South Wales Electricity Board Demonstration Theatre, The Hayes, 5.45 p.m. Illuminating Engineering Society. Cardiff Centre. "School Lighting," by J. F. Roper. (Joint meeting with Cardiff Branch, E.A.W.)

LONDON.—Savoy Place, London, W.C.2, 5.30 p.m. Institution of Electrical Engineers. "Electrical Weighing" (Measurements Section paper) by Dr. H. I. Andrews.

Friday, 4th November

BIRMINGHAM.—Imperial Hotel, Temple Street, 6 p.m. Illuminating Engineering Society, Birmingham Centre. "New Definitions and Units of Light," by J. G. Holmes.

Botanical Gardens, Edgbaston, 8 p.m. I.E.E. South Midland Students' Section. Annual dance.

Saturday, 5th November

LONDON.—I.E.E. London Students' Section. Visit to Union Cold Storage Co., Ltd., Nelson's Wharf.

CONTRACT INFORMATION

ACCEPTED TENDERS AND PROSPECTIVE ELECTRICAL WORK

Contracts Open

Where "Contracts Open" are advertised in our "Official Notices" section, the date of the issue is given in parentheses.

Brazil.—PORTO ALEGRE.—9th January. State Commission for Electric Energy. Hydro-electric power plant at Santa Rosa. (C.R.E. (I.B. 27419/49. Ten/688.)*

10th January. Sub-station equipment. (C.R.E. (I.B.) 29169/49. Ten/721.)*

Haslingden.—12th November. Borough Council. Electrical works for fifty permanent houses and eight bungalows to be erected on the Rising Bridge estate. J. Mason, borough engineer, Municipal Offices, Bury Road.

India.—MADRAS.—7th November. Government Electricity Department. Supply of 570 tons of copper conductors. (C.R.E. (I.B.) 28442/49. Ten/733.)*

Luton.—7th November. Town Council. Installation of electrical services, wiring and equipment for Ashcroft Road County Primary Infants' School. Borough engineer, Town Hall.

Manchester.—31st October. Health Committee. Rewiring of electrical installation at Langho Colony. (21st October.)

New Zealand.—WELLINGTON.—21st February. State Hydro-Electric Department. 22 kV switchgear. (C.R.E. (I.B.) 29662/49. Ten/739.)*

11th November. Post and Telegraph Department. Supply of 200 metal-cased condensers. (C.R.E. (I.B.) 29548/49. Ten/741.)*

16th November. Director-General (Stores Division) G.P.O. Supply of thirty-two petrol engine generator sets and twenty diesel engine generator sets.

15th November. State Hydro-Electric Department. 20,000 kVA transformer banks and one spare unit. (C.R.E. (I.B.) 29661/49. Ten/743.)*

Northallerton.—North Riding County Council. Additions to lighting installation at the County Hall. (21st October.)

Portsmouth.—City Council. Renewal of electrical installation on South Parade Pier. (21st October.)

South Africa.—DURBAN.—6th January. City Electricity Department. Cable and electrical materials. (C.R.E. (I.B.) 28634/49. Ten/728.)*

Southampton.—23rd November. Corporation Electrical installations on housing estates. (See this issue).

Southport.—14th November. Street Lighting Department. Electric lamps. (21st October.)

Swindon.—Wilts County Council. Rewiring of Technical College. (21st October.)

Uruguay.—MONTEVIDEO.—25th November. Usinas Electricas y Telefonos del Estado. Telephone exchange accumulator batteries. (C.R.E. (I.B.) 29743/49. Ten/736.)*

*Specifications may be inspected at the Commercial Relations and Exports Department, Board of Trade, Thames House North, Millbank, S.W.1. Victoria 9040.

Orders Placed

Birkenhead.—Corporation Roads Committee. Installation of lighting, heating and power at Derby Road Highways Depot (£318).—Merseyside and North Wales Electricity Board.

Morpeth.—Rural Council. Electrical installations in houses on the Broomhill estate (£1,688).—J. and A. Oliver, Ashington.

Paisley.—Town Halls Committee. Lighting fittings throughout the Town Halls (£3,200).—Falk, Stadelmann & Co., Ltd.

Southwark.—Borough Council. Renewal of the electrical fittings in Newington Public Hall (£1,001).—Arc Installations, Ltd.

Southport.—Supply and installation of 96 columns complete with lanterns, wiring and time switches, for lighting Lulworth Road and Waterloo Road (£4,576).—Metropolitan-Vickers Electrical Co.

Torquay.—Corporation. Electrical installation at the municipal chambers (£265).—Colston Electrical Co.

Contracts in Prospect

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Albrighton. — Junior school; Jackson & Edmonds, architects, 65, New Street, Birmingham.

Ashington.—Technical college; county architect, County Hall, Newcastle.

Batley.—Houses (28) and 44 flats, Staincliffe estate; borough engineer.

Bellingham.—Houses (28), for R.D.C.; W. Dixon & Son, 1, Collingwood Street, Newcastle-on-Tyne.

Benton (Northumberland). — Additions to Henderson Hall to accommodate another 200 students for King's College; Mauchlen and Weightman, architects, 12, Saville Row, Newcastle-on-Tyne.

Birmingham.—Ambulance depot (£20,500), Henrietta Street and Hospital Street; city surveyor.

Blackhall (Co. Durham).—R.C. church; C. M. Yuill, Ltd., builders, Villiers Street, West Hartlepool.

Blackpool. — Factory, Mowbray Drive; Cameron Confectionery Co., Ltd., 4, Cameron Avenue.

Bradford.—Clayton infants' school; Frank Robinson & Sons, Bradford.

Bridgend.—Houses (68), Cefn-Glas site; U.D.C. surveyor.

Bolton.—Pithead baths, &c., Brackley Col-

liery; National Coal Board, Hobart House, Grosvenor Place, S.W.1.

Bootle.—Boys' school, Merton Road and junior girls' school, Pembroke Road; Cookson & Gibbs, architects, 34, Derby Street, Ormskirk.

Bournemouth. — Dwellings (196), Kinson estate; borough architect.

Flats (40), Kinson; Barnes & Green Building Co., Ltd., 865b, Winton Road, Winton.

Stores, 18/20, Commercial Road; F. W. Woolworth & Co., Ltd., 1, New Bond Street, W.1.

Bradford.—Factory and administrative block, Barnard Road, for Disabled Persons Employment Corporation, Ltd.; J. Pullan & Sons, Ltd., builders, Marley Terrace, Beeston, Leeds.

East Retford.—Houses (92), Hallcroft estate (scheme 3); Vallance and Westwick, architects, White Hart Chambers, Mansfield.

Eccles.—Houses (50), Ellesmere estate; T. Elce, surveyor.

Enfield.—Houses (200), Bulsmoor Lane and Holtwhites Hill estates; U.D.C. surveyor.

Factory, Gt. Cambridge Road; Spencer, Heath & George, Ltd., Garfield Road.

Felling-on-Tyne.—Houses (420), Wardley, for the U.D.C.; D. W. Green, housing architect.

Glasgow.—Fire station, Cuthelton Street; city engineer.

Extensions to Logan & Johnstone College (£25,000); R. J. Walker & Smith, architects, 180, West Regent Street.

Factory, Hillington Road; Wylie, Shanks & Wylie, architects, 120, Blythswood Street.

Great Yarmouth.—Infants' school, Magdalen College estate; borough engineer.

Hendon.—Flats (84), Hyde Cottage site, Edgware Road; John C. S. Soutar, architect, Wyldes, North End, N.W.3.

Hove.—Flats (28), Sunninghill estate; borough engineer.

Hull.—Houses (24) and flats (18), Marlborough Terrace; city architect.

Johnstone.—Houses (155), Cochrane Castle site; Scottish Special Housing Association, 15, Palmerston Place, Edinburgh.

Leamington Spa.—Houses (34), Lillington; Lewis & Watters, builders, Lime Avenue.

Leeds.—Research laboratories for Yorkshire Copper Works, Hunslet; Wm. Airey & Son, Ltd., builders, Eldon House, Eldon Street.

Adaptation of Iveson House, Cookridge (£12,454); Dunhill Bros., Selby Road, Leeds.

Liverpool.—Secondary school, Stapleton Avenue, Speke (£117,462); Morrison & Sons, Ltd., builders, Grange Terrace.

London.—BATTERSEA.—Five-storey block of flats, 203/217, Battersea Park Road; Howes & Jackman, architects, 1, Verulam Buildings, Gray's Inn, W.C.1.

PUTNEY.—Flats (252), 26 cottages, and six shops with maisonettes over, Roehampton Lane, for L.C.C.; Stewart & Hendry, architects, 90, Fenchurch Street, E.C.3.

ST. PANCRAS.—Dwellings (122), laundry, etc., Camden High Street; Graham Dawbarn, architect, 5, Gower Street, W.C.1.

Lowestoft.—School, Roman Hill, for East Suffolk E.C.; E. J. Symcox, county architect, Ipswich.

Lytham St. Annes.—Dwellings (70), Kilnhouse Lane estate; Walter Heap, town clerk, Town Hall.

Oxford.—Infants' school, Barton estate; T. G. Chandler, city architect.

Macclesfield.—Houses (34), Ivy Road estate; borough architect.

Renfrew.—Two schools at Johnstone; master of works, Education Offices, 16, Glasgow Road, Paisley.

Ripley.—Houses (50), Elms estate; A. H. Smith (Builders), Ltd., Sutton-in-Ashfield.

Shipley.—Houses (52), Wrose Road, U.D.C. surveyor.

Somerset.—Three infants' schools, Bridgwater and Taunton; R. O. Harris, county architect, Park Street, Taunton.

Tynemouth.—Fire station and ambulance station, Hartburn Road; borough engineer, Howard Street, North Shields.

Walsall.—Factory, Alumwell Road; Anochrome, Ltd., Prince Street, Pleck.

Warrington.—Factory, Factory Lane; Joseph Crosfield & Sons, Ltd., Bank Quay.

Wimbledon.—Three-storey extension to Technical College, Kingston Road, Surrey; county architect, County Hall, Kingston-on-Thames.

Worsborough (Yorks).—Houses (40), Elm House estate; J. Shepherd, U.D.C. surveyor, Saville House, Worsborough Bridge, Barnsley.

Yorkshire.—Police houses (24), for West Riding Standing Joint Committee; county architect, County Hall, Wakefield.

Trade Marks

APPLICATIONS have been made for the registration of the following trade marks. Objections may be entered within a month of 19th October.

MEZ. (design). No. 668,173. Class 7. Electricity generators, electric motors (not for land vehicles) and electric welding machines, and parts. MEZ (design). No. 668,175. Class 11. Electrical apparatus for lighting, heating, cooking, refrigerating and ventilating.—Moravske Elektrotechnicke Zavody, Narodni Podnik, Olomouc, Czechoslovakia. Address for service, c/o Reddie & Grose, 6, Breams Buildings, London, E.C.4.

TANIA. No. 678,584. Class 7. Electric floor-polishing machines (other than for domestic use).—Rollnick & Gordon, Ltd., Capital Works, Empire Way, Wembley, Middx.

WELCOBEL. No. 671,340. Class 9. Electric apparatus and instruments (none being lamps) and parts thereof, all included in Class 9.—Wespelaar Electro-Constructions, Wespelaar-le-Louvain, Belgium. Address for service, c/o Marks & Clerk, 57 and 58, Lincoln's Inn Fields, London, W.C.2.

MINERVA (design). No. 677,088. Class 9. Electronic smoke detecting apparatus.—Electronic Instruments, Ltd., 17, Paradise Road, Richmond, Surrey.

ELECTROBLOC. No. B673,461. Class 11. Electrically operated apparatus for steam generating, heating, lighting, cooking, refrigerating, drying and ventilating.—J. W. Woolley & Co., Ltd., Two Gates Works, Tamworth Road, Tamworth, Staffs.